

*Response to the second round of public comments on the  
Final Draft Stormwater Management Manual for Eastern Washington*

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**Response to First Round of Public Comments**

**2. Public workshops (June 23-26)**

- a. Obviously, a huge amount of effort put forth by agency reps to try to be responsive.  
*COMMENT NOTED. Thank you.*
- b. Comments were well considered even though the final result –manual change– may not have been what the commenter desired.  
*COMMENT NOTED. Thank you.*
- n. It seems like not all requested changes were incorporated into the Final Draft Manual.  
*COMMENT NOTED. This is true. All comments were considered but not all resulted in changes to the Manual.*

**General Comments**

**2. Public workshops (June 23-26)**

- d. Discuss projects that cross several local districts.  
*RESPONSE: A new paragraph will be added to Chapter 1.3.10 that states: “Jurisdictions may have interconnected storm sewer systems. Neighboring jurisdictions are encouraged to work together to establish consistent design criteria for stormwater facilities since the climatic, geologic and hydrologic variation among neighboring jurisdictions is likely to be minimal. Where municipal separate storm sewer systems are interconnected between jurisdictions with different requirements, the downstream jurisdiction’s requirements apply.” See also comment 16.ww under Chapter 2, CE 8.*

**16. WSDOT (August 25)**

- c. General comment: The manual is very redundant in many sections and tends to excessively use repetitive statements throughout (e.g. Definitions, Core Element content, etc.). It would be less cumbersome and more user friendly if direction could be cited in one location and then referenced where necessary. This also makes revisions easier to manage since it would eliminate the need to make changes to multiple sections.

*COMMENT NOTED. Without specific suggestions, it is difficult to make organizational changes at this stage of the development of the Manual.*

- d. General comment: One page of this document or each chapter should be dedicated to defining the symbols or define them when they are used. See section 4.4 for one example.

*COMMENT NOTED. Symbols should be defined where they are presented in equations, which is more helpful to many users than having to reference a definition page or section. This appears to be done throughout Section 4.4.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- k. General Comment: The Draft Manual is extremely technical and far too challenging for the average small businessperson to understand and effectively apply. This manual is designed to apply to very small projects as well as very large projects. Small auto recycling firms will almost certainly have to hire outside consultants to advise them on what this manual says and requires of them. Recommendation: We recommend a supplement to this manual be prepared for small facilities that an average person with very limited technical expertise could review, understand and apply.

*COMMENT NOTED. We agree that additional manuals tailored to specific types of projects would be helpful to many project proponents, and encourage local agencies and business groups to assist in developing such manuals. At the same time, it may be impracticable to eliminate all of the complexities that require project proponents to seek professional technical assistance in planning and designing effective stormwater management programs and facilities.*

**Foreword**

**4. Department of Ecology (July 30)**

- j. In looking for the tables of contents, readers might expect to find them in the front of the volume; but instead they are found it at the beginning of each chapter. Suggest including a detailed TOC at the beginning of the final document.

*RESPONSE: A TOC with mid-level detail similar to the one provided at the beginning of volume A will be provided at the beginning of the final document.*

**10. Yakima County (August 20)**

- c. Foreword: Page FOR-2, Update the timeline for the Model Program to say, “The final Model Program was published in August 2003. It is available on this website \_\_\_\_.”

*RESPONSE: Agree to make change with correct date and web address.*

**Chapter 1**

*(note that the comments on section 1.3.3 are included with the section responding to comments on Chapter 7. Some additional comments on UIC may be included with the section responding to comments on Chapter 5.6)*

**2. Public workshops (June 23-26)**

1. The full text of RCW 90.48.080 should be inserted into Chapter 1, such as in the upper left corner of Figure 1.1.

*RESPONSE: We believe that the applicable regulations need to be referenced but not fully quoted in the Manual. Suggest adding a section between Sections 1.3.9 and 1.3.10 discussing relevant sections of the State Water Pollution Control Act. Full text of the code would not be inserted, only a summary and context of the relevant State regulations. (See also comment 12.b)*

**4. Department of Ecology (July 30)**

- g. On page 1-13, change heading of section 1.3.4 to read Underground Injection Control (UIC) Program

*RESPONSE: Will change heading.*

- s. On Page 1-8 is the highway SR 18 or SR 8?

*RESPONSE: SR 8 (See comment 16.h). Will correct text.*

**9. City of Spokane (August 20)**

- a. Page 1-10, third line from the top, change ...(1.5 to 2-year frequency)... to ...(six month to one-year frequency)... or make consistent with ...once or twice a year...

*RESPONSE: Will change "once or twice a year" to "every year or two."*

**10. Yakima County (August 20)**

- d. Chapter 1 – Introduction: Section 1.2.1. Presentation of total Heavy Metals concentrations as if it represents the actual toxicity of stormwater. It has long been known by soil and stormwater scientists that heavy metals are often a naturally occurring component of soil minerals. As such, some level of particulate phase metals is expected to be found in stormwater sediments (*and local soils*) and should not be considered a toxicity problem. In addition, some heavy metals that are initially dissolved in stormwater rapidly bind to sediments and organic matter in the water column and in the vadose zone. These solid forms of heavy metals are not toxic, are usually highly immobile, and should not be compared with aquatic toxicity standards. The dissolved forms of heavy metals most closely represents the toxic fraction of heavy metals, and is usually present at much lower concentrations than the total metals concentrations particularly when TSS is present. Presenting total metals while discussing the toxicity of stormwater (*Section 1.2, etc.*) is misleading to readers who are not experts in these matters. Nowhere in the Ecology Manual is this differentiation recognized or discussed, instead a mix of dissolved and total metals is presented.

*COMMENT NOTED: Dissolved data are presented where they are available. Water quality standards in Washington State use both dissolved and total fractions. Comparisons are not made unless data and standards are expressed in the same fraction. The intent is to show that there is a problem. No additional information is necessary here.*

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- e. Section 1.2.2, page 1-10, 3<sup>rd</sup> paragraph – Please reference the source of the statement “Research has shown that as developed impervious areas reach 5% of land cover ...”  
*RESPONSE: Will cite the references, which are already in the bibliography. Will also insert the phrase “in many areas around the country” after Research.*
- h. Section 1.3.9, page 1-16, 2nd paragraph, 1st sentence – Delete the word “to” after “added”.  
*COMMENT NOTED: The suggested change would affect the intended meaning. Will leave as is.*
- i. Section 1.3.9, page 1-16, 3rd paragraph – Capitalize “federal” or change it to “NPDES”.  
*RESPONSE: Will add NPDES.*
- j. Section 1.4.1, page 1-17, 2nd paragraph – Suggest adding numbers as shown “(1) source control, (2) water quality treatment, and (3) flow control.” I think it will read better.  
*RESPONSE: Will add the numbers as suggested.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- a. Section 1.1, page 1-1: The fourth paragraph could be reworded to better mesh with protective versus corrective terms used in the remainder of this manual as well as the DOT Highway Runoff Manual.  
*COMMENT NOTED: This paragraph is about the scope of the manual, e.g. what it does and does not (or can and cannot) do to protect water quality. The policy of using the Manual as a key element of a presumptive approach to protecting water quality is addressed first in section 1.1.1 and in more detail in section 1.1.3.*
- d. Section 1.2.2, page 1-11 and section 1.4.4., page 1-19: Pre-developed and developed discussion occur for the first time in these sections. Generally, consistent terminology needs to be used throughout the manual and the definitions should be clear in the glossary. We recommend the use of three terms (pre-developed, existing and developed conditions). The term post developed should be eliminated. See comment #q below (CE6).  
*RESPONSE: We are concerned that “developed” could be confused with “existing” for many projects, and suggest using the term “proposed” instead. This will require a careful search and replace in Ch 1, 2, and 4. See also comment 9.o. Final wording will be: Pre-developed conditions; Existing conditions; and Proposed development conditions. All three terms will be added to the glossary.*

**12. Cheryl Morgan, Citizen (August 21)**

- b. It is inherent that RCW 90.48.080 be entered within the Final Document in large print. It should read: “RCW 90.48.080 Discharge of polluting matter in waters prohibited. It shall be unlawful for any person to throw, drain, run, or otherwise discharge into any of the waters of this state, or to cause, permit or suffer to be thrown, run, drained, allowed to seep or otherwise discharged into such waters any organic or inorganic matter that shall cause or tend to cause pollution of such waters according to the determination of the department, as provided for in this chapter.” This is the document that has been presented to rural land owners

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along with “there shall be zero discharge”. Why hasn’t this same RCW 90.48.080 as I have entered above not been entered within the Final Draft?

*RESPONSE: See comment 2.1.*

**13. CPM Development Corporation (August 25)**

- h. The State Department of Fish and Wildlife’s (DFW) Hydraulic Project Approval (HPA) Program is inappropriately listed as a regulatory program that may require compliance with the SMMEW. In 2002 the Legislature passed and enacted SHB 2866 which eliminates the ability of DFW to require compliance with the SMMEW as a condition of the HPA. Section 1.3.7 should be eliminated from the SMMEW.

*RESPONSE: Within NPDES permitted jurisdictions, HPAs address only structural work. But outside these jurisdictions, which represents the majority of the land area in eastern Washington, HPAs may address stormwater quality. Will clarify this in section 1.3.7.*

**16. WSDOT (August 25)**

- f. Page 1-4, Figure 1.1. The percentage of transportation infrastructure as stated (i.e., 50 percent and 75 percent of impervious surface within any single watershed) still seems very high. What is the source of these figures?

*COMMENT NOTED: See Item 12.40.1 in the responses to comments on the final draft Manual. These references are now included in the Bibliography.*

- g. Page 1-6, Section 1.2.1 Water Quality Changes. First sentence has incorrect grammar.

*COMMENT NOTED: We disagree.*

- h. Page 1-8. The SR18 project in Thurston County is on SR8, not SR18.

*RESPONSE: Will make the correction.*

- j. Page 1-19. Under the Flow Control BMP's, what is meant by "not too near the land surface"? This is vague. There needs to be more guidance or a reference to a design requirement provided.

*RESPONSE: Will change to “within 5 to 15 feet of the land surface, depending on local conditions.”*

- k. Page 1-20. The third sentence in the first paragraphs refers to conversion from “forested”. The more appropriate term to use for eastern Washington Please is “natural” or “native”. This reference should be checked and changed throughout the manual.

*RESPONSE: Agree to make change and check for other references.*

- l. Page 1-20. The reference to a continuous model for wetlands might lead designer to use MGSFlood, KCRTS, or WWHM and really they should use HSPF. In addition the wording should be changed to “may require”.

*COMMENT NOTED: This is background material, not design guidance.*

**18. Spokane County (August 25)**

- b. Section 1.4.4, Flow Control BMPs, Page1-18, first paragraph: The last sentence should be revised to include the “may” when referring to the ‘data collection’ and ‘use of a continuous runoff model.’ This concurs with the language in the rest of the paragraph.

*COMMENT NOTED: Assume this reference is to first paragraph on p. 1-20. This is background information, not design guidance. It is not possible to*

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*accurately estimate wetland hydroperiods without the information listed. See also comment 16.l.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- b. UIC Facilities - In discussions with those preparing this Manual, we understand that evaporation/infiltration ponds and other UIC facilities are encouraged by the Department in eastern Washington. Recommendation: In Chapter 1 of the Manual, we recommend you provide a section to advise non-technical readers of this preference and other preferences the Department may have in handling stormwater in Eastern Washington.

*COMMENT NOTED: We believe the preference of stormwater disposal via infiltration is sufficiently highlighted in sections 1.4.4, 2.2.4 and 2.2.6.*

**Chapter 2**

*(note that comments on Core Element 2 are included with the section responding to comments on Chapter 7. Some additional comments on UIC may be included with the section responding to comments on Chapter 5.6)*

**General Comments**

**16. WSDOT (August 25)**

- m. General comment on Chapter 2: The information contained within the *Core Element* section in *Chapter 2* is exhaustive and difficult to condense into what the bottom line is (e.g. Core Element #5 is more than 9 pages long). There is too much emphasis on the "why" rather than simply focusing on the "what". The Core Elements should be reduced to minimum threshold requirements in more of an outline form up front with any supporting explanations to follow afterward in the section.

*RESPONSE: We believe that the “why” supports effective implementation of the “what” and that there are a sufficient number of exceptions and special cases to avoid oversimplification in an outline form. Ecology will try to come up with an explanatory table to include at the beginning of the chapter.*

- n. Page 2-i, TOC: Section 2.2.6 should read as page 2-24 instead of 2-23.

*COMMENT NOTED: Suggestion is correct but pagination and TOC will change for final manual.*

**18. Spokane County (August 25)**

- c. Section 2.1, Introduction, Page 2-1, first paragraph: The “suggested response” proposed at the January 30, 2003 Manual Subcommittee Meeting was to end the second sentence after the word “Washington,” and possibly to clarify the guidance that this chapter was intended to provide. No change is evident in the text. Spokane County’s original comment had been to refer to ‘discharges to waters of the State’ in order to direct the reader to look up the definition and see what the definition encompasses.

*RESPONSE: Will make the suggested change.*

**New Development**

**10. Yakima County (August 20)**

- l. Chapter 2- Core Elements for New Development and Redevelopment: Section 2.1.1, page 2-2, last paragraph – Suggest adding, “under certain thresholds

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established by this manual or adopted by local jurisdiction.”

*RESPONSE: Will add the following sentence: “These projects are subject to the thresholds and requirements set forth in this Manual or adopted by a local jurisdiction or agency.”*

Redevelopment

**4. Department of Ecology (July 30)**

- a. For high use roads (as opposed to high use intersections), specify in the treatment menu that oil control needs to be done using an absorptive surface such as a bioswale, catch basin inserts or perhaps the booms proposed by WSDOT – not using an oil-water separator, which would not be effective for these smaller quantities of oil. This applies to Chapter 2 redevelopment section and Core Element 5 water quality treatment, as well as in Chapter 5, specifically on pp. 5-6&7 and 5-10&11 (Figures 5.2.1&2), and in Chapter 5.6.

*RESPONSE: Suggested changes need to be addressed in both chapters 2 & 5.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- f. Section 2.1.2, page 2-4: Clarify the 4th, 5th, 6th, and 8th bullets concerning the definition and use of the term upgrade and its conflicts with the maintenance exemptions. The 3rd bullet uses the term upgrade correctly. We suggest eliminating the word upgrade and its definition in the other bullets and use the term replaced to be consistent with core element #5. We believe the intent is to apply core element #5, when a road or parking lot is replaced or reconstructed to improve its capacity when the described traffic volume thresholds are met. Otherwise it is considered maintenance. The wording under Road Maintenance and Upgrades should be revised accordingly.

*RESPONSE: Suggest adding definition of upgrade to the glossary. All bullets referring to road and parking surfaces should read “replaces or upgrades” and the only maintenance exemptions are those specifically listed on p. 2-8.*

*Upgrade projects that do not meet the ADT threshold are still upgrade projects, not maintenance practices, and are subject to the other core elements. See also 16.u under Partial Exemptions below.*

- g. Section 2.1.2, page 2-5: The 10th bullet should have read “...water quality problem from stormwater...”

*RESPONSE: Disagree, since stormwater is still a known contributor, but suggest dropping this bullet and relying only on requirements set forth in a water cleanup plan as indicated in the following bullet. Local jurisdictions are advised that they may have difficulty meeting TMDL waste load allocations if they wait until corrective actions are required by a TMDL.*

- h. Section 2.1.2, page 2-5: The third sentence in the paragraph pertaining to local requirements under Core Element #6 should have read “...projects regulated by the local requirements ...”

*RESPONSE: See comment 18.f. Will change “new” to “local.”*

**16. WSDOT (August 25)**

- b. General comment: Average Daily Traffic (ADT) count requirements should be more defined and specific. ADTs come in the form of a) existing, b) build out and/or, c) design year (capacity improvement projects only). This could be

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more directly related to the type of proposed improvement (i.e., minor safety improvement at an intersection vs. a major highway expansion project). The "design life of the project" can mean different things to different users of the manual.

*RESPONSE: The intent is that the ADT used to evaluate whether the threshold is met between the execution of the project and the next expected project for the same surface assures that the project proponent will take advantage of the soonest period of disruptive construction to add appropriate stormwater treatment facilities. Local governments may also wish to impose stricter requirements to protect certain receiving waters. Suggest adding statement of intent to the definition in the glossary, but leaving flexibility for various types of projects and best professional judgment of the designer. Will change to "design year" and clarify in glossary that the term is referring to the project life as opposed to the useful life of the surfaces.*

- q. Page 2-2, Section 2.1.2. Should refer reader to the glossary or define at this point.

*COMMENT NOTED: Definition is in both places.*

- r. Page 2-4, hollow bullet items. Suggest placing these items in a chart that is easier to read. Our reviewers lost track of what they were reading after the third bullet.

*RESPONSE: Suggest numbering the bullets and grouping them according to land use (industrial, commercial, traffic, high-use, sensitive receiving water).*

- s. Page 2-4. The requirement requiring oil if the average daily traffic volume is greater than 30,000 vehicles per day should be removed. It is excessive (exceeding the requirements in SMMWW) and contrary to Core Element #5 oil control requirements for roadways. Page 2-16 states the limits of the oil control requirement to what is referred to as a "high-use site" specifying "A road intersection with a measured average daily traffic (ADT) count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway, excluding projects proposing primarily pedestrian or bicycle use improvements."

*RESPONSE: Oil control is still necessary, but the approach is different (a specific subset of the BMPs listed for oil control will work). See comment 4.a. This will be addressed in Core Element 5 and Chapter 5 as well.*

- t. Page 2-6, Section 2.1.2 – Supplemental Guidelines. The second paragraph requires rewording to clarify that the intent of the fee in lieu of construction option pertains to its use to fund the construction of regional stormwater treatment facilities.

*RESPONSE: Will clarify the intent of the fee in lieu and how local governments should and must use the funding received. Awaiting suggested language. See 4.e under CE 5.*

**18. Spokane County (August 25)**

- d. Section 2.1.2, Redevelopment, Objective, Page 2-3: The first paragraph should direct the reader where to find the "noted use(s)" and "area thresholds." Third paragraph, second sentence that begins with "NPGIS," but discusses pollutant loadings is confusing.



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*RESPONSE: In the first paragraph, will change “noted use and area thresholds” to “the use and area thresholds (listed in the guidelines below)...” In the third paragraph, the sentence is correct as written but may be more easily understood if organized differently; suggest changing to: “The majority of impervious surfaces in a watershed are either NPGIS or PGIS with low pollutant loading...”*

- e. Section 2.1.2, Redevelopment, Guidelines, Page 2-3: This could be more understandable from a developer and his design engineer’s perspective if it said that the impact due to the entire project at full build-out exceeds the threshold, then the criteria apply.

*RESPONSE: Agree to the suggested wording and will revise the middle sentence of the paragraph.*

- f. Section 2.1.2, Redevelopment, Guidelines, Page 2-5: The paragraph in the center of the page was discussed and it was agreed it would be clearer if the word “new” was replaced with “local” in the third sentence.

*RESPONSE: Agreed. See comment 11.h.*

- g. Section 2.1.2, Redevelopment, Guidelines, Page 2-6: The second paragraph seems to imply that a local jurisdiction may provide an exemption to a Core Element only if a regional facility exists that fulfills the requirements. Is there no other time that a local jurisdiction could exempt a Core Element? It seems too restrictive as worded. We agree that jurisdiction wide, Ecology must be involved, but on a site-by-site basis, a local jurisdiction should be able to assess the situation.

*COMMENT NOTED: Per existing provisions in the Manual, local jurisdictions may also exempt projects from CE 6 and provide expedited means of compliance with CEs 1 and 7; fee-in-lieu also may provide exemptions (see 16.t above and 4.e under CE5). Basin planning and evaluation are needed to provide the basis for broad exemptions, but jurisdictions will also be assessing requirements on a site by site basis.*

#### Partial Exemptions

##### **16. WSDOT (August 25)**

- u. Page 2-8, Road Maintenance and Upgrades. This section does not make sense with the previous definitions. The first two bullets seem to be a “replaced” PGIS. Which has to comply with all core elements over certain thresholds. Does this mean they only have to comply with Core Element 2. This area needs further clarification.

*RESPONSE: To clarify the intent, suggest dividing into “Surface replacements that do not increase the traffic capacity of the roadway” (first two bullets) and “Overlays that do not increase the traffic capacity of the roadway or parking area” (third bullet and sub-bullets). The title of the subsection should be “Road and Parking Area Maintenance.”*

#### Local Exceptions/Variations

##### **18. Spokane County (August 25)**

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- h. Section 2.1.5, Local Exceptions/Variations, Guidelines, Page 2-8: First bullet should be reworded to state, "There are special physical circumstances or conditions affecting the property that would prohibit the strict application of these provisions." As currently worded, this section would be abused. Second bullet should say "exception or variance" and "nor" instead of "and" at the end of the statement.

*RESPONSE: Agree to suggested change to first bullet, but retain statement that "every effort to find alternate ways to meet the intent of the Core Elements has been made" (could become the second bullet or be combined with the last bullet). For the bullet at top of p. 2-9, agree to add "or variance" but disagree that "and" should be changed to "nor."*

- i. Section 2.1.5, Local Exceptions/Variations, Guidelines, Page 2-9, last paragraph: The "suggested response" proposed at the January 30, 2003 Manual Subcommittee Meeting was to state who the 'permitting authority' (Ecology) is, and to delete "generally do not require approval of the permitting authority" and add to the end of the sentence "or the permitting authority for an individual project." No change is evident in the text. The 'permitting authority' doesn't seem to be clarified throughout the document, as requested.

*RESPONSE: Agree to change to "Ecology or other permitting agency;" remind jurisdictions that other agencies may act as permitting authorities per Ch 1.4.*

Core Elements Introduction

**18. Spokane County (August 25)**

- j. Section 2.2, Core Elements, Page 2-9, second paragraph: The first sentence is oddly worded; consider rephrasing, as 'excusing' the discharge's obligation is awkward.

*COMMENT NOTED: This is standard language.*

Core Element 4

**16. WSDOT (August 25)**

- w. Page 2-12, Applicability to Wetlands. Everything after the first sentence should be deleted. Rerouting of runoff is not a source control BMP. The requirements of Core Element #4, #5 and #6 are sufficient to protect wetlands. Further protection may be required in cases of documented, specific, local, or onsite evidence, but not as a general statement in the manual. In such instance, it should be added under local requirements.

*COMMENT NOTED: The remainder of the paragraph addresses concerns iterated by wetlands specialists and appropriate means of avoiding contact of a sensitive receiving water with pollutants.*

Core Element 5

**4. Department of Ecology (July 30)**

- a. For high use roads (as opposed to high use intersections), specify in the treatment menu that oil control needs to be done using an absorptive surface such as a bioswale, catch basin inserts or perhaps the booms proposed by

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WSDOT – not using an oil-water separator, which would not be effective for these smaller quantities of oil. This applies to Chapter 2 redevelopment section and Core Element 5 water quality treatment, as well as in Chapter 5, specifically on pp. 5-6&7 and 5-10&11 (Figures 5.2.1&2), and in Chapter 5.6.

*RESPONSE: Suggested changes need to be addressed in both chapters 2 & 5.*

- c. For design storms and snowmelt factors on p. 2-20 through 2-22, design according to other approved manuals is acceptable.

*COMMENT NOTED: See 16.cc and ee below. Will use “agency or local government” instead of “jurisdiction” where possible and state that the other manual must be approved by Ecology.*

- d. On p. 2-22, insert a paragraph break before the italicized sentence at the end of the first paragraph. In the first sentence of the same paragraph, delete the word “the.”

*RESPONSE: Will make changes.*

- e. Need to clarify fee-in-lieu intent and language on p. 2-6. Suggested language may be provided by HRM development team.

*RESPONSE: Will clarify, but await language. See 16.t under Redevelopment.*

**9. City of Spokane (August 20)**

- b. Page 2-20, under Water quality design volume: why is it necessary to direct each jurisdiction to make a choice? this directive should be omitted.

*COMMENT NOTED: This issue was discussed in detail in preparing the final draft manual and the decision made by the subcommittee at that time stands.*

*Jurisdictions are not required to choose, they may accept the defaults.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- i. Section 2.2.5, page 2-19: Include a definition for moderate use sites in the glossary like provided for high use sites.

*RESPONSE: Agree to add definition moderate use sites to glossary and definitions section at the beginning of CE 5. Medium use sites will be aligned with moderate pollutant loadings, and definition of high use sites will highlight the specific differentiation with respect to oil control requirements. Will also address use of heavy equipment at the respective sites.*

- j. Section 2.2.5, page 2-20: Under water quality design storm, the default method should be method 2 or the SCS Type 1A as recommended by the consultant.

*COMMENT NOTED: Partly disagreed. Consultant recommended Type 1A as a reasonable approximation of Method 1, which is acceptable for Regions 2 and 3 but not Regions 1 and 4 for flow control requirements. Subcommittee desires that default methods for Water Quality and Flow Control be consistent. Local jurisdictions may still adopt other methods. Default method will be changed to Type 1A for Regions 2 and 3 only. Also see 18.p.*

- k. Section 2.2.5, page 2-21: The following revisions should be made under the snowmelt paragraph. Revise the title of this paragraph to Snowmelt Considerations. Remove the 4th sentence of this paragraph since snowmelt factor is only one method for calculating snowmelt.

*RESPONSE: Agree to change title, but will leave 4<sup>th</sup> sentence with reference to other possible methods provided.*

**14. Stormwater Management Inc. (August 25)**

- b. Chapter 2 - Core Elements for New Development and Redevelopment, Metals Treatment Exemption (pg 2 – 18): The Eastern Manual states: Discharges to nonfish-bearing streams are exempt from additional metals treatment requirements. Comment: SMI questions the rationale for using non-fish bearing streams as the criteria or catalyst for a metals treatment exemption. SMI recommends that Ecology omit the nonfish-bearing stream portion of the metals treatment exemption. Rationale: There are other aquatic species, for example macroinvertebrates, that would benefit from metals removal from stormwater runoff. Inclusion of metals treatment for nonfish-bearing streams would provide a benefit to existing macroinvertebrate populations, i.e. would potentially reduce the frequency of ontogenetic shifts in macroinvertebrate populations from sensitive to less sensitive species. It should be Ecology's goal to provide protection and preservation for integral components of a watershed's health, not just fish. Since primary and secondary producers would be affected by land use and development, and these activities would directly impact food web dynamics, a metals treatment exemption by water body should not be justification or rational for a metals treatment exemption.

*COMMENT NOTED: While we do not disagree with your concerns, basic treatment is still required for these projects and will remove a portion of the metals in the runoff. The majority of non-fishbearing streams in eastern Washington are irrigation supplies and return flows, where other water quality problems are likely to pose a greater risk to instream populations.*

**16. WSDOT (August 25)**

- b. General comment: Average Daily Traffic (ADT) count requirements should be more defined and specific. ADTs come in the form of a) existing, b) build out and/or, c) design year (capacity improvement projects only). This could be more directly related to the type of proposed improvement (i.e., minor safety improvement at an intersection vs. a major highway expansion project). The "design life of the project" can mean different things to different users of the manual.

*RESPONSE: Same as response to 16.b under Redevelopment.*

- y. Page 2-16. The definitions of "off-line" and "on-line" appear in the glossary, but not here. There should be a statement such as "(see glossary)" added when a term or phrase is mentioned for the first time to alert the reader that the term has been defined in the manual.

*COMMENT NOTED: Cannot find references to on- or off-line on this page. Frequent parenthetical notes to "see glossary" would interfere with readability.*

- z. Page 2-18, Metals treatment exemptions. Change second sentence to improve readability to: "Direct discharges to the following lakes and rivers are exempt..."

*COMMENT NOTED: Suggested change would change the meaning.*

- aa. Page, 2-19 Oil Control Requirements. Where in Chapter 8 are the spill control BMP's? The only spill control BMP in the manual that our reviewers found was in Chapter 5, page 102 in figure 5.10.3.

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*COMMENT NOTED: The specific requirements are contained within source control measures for targeted land uses.*

- bb. Page 2-19. Under the *metals treatment requirement* for freeways, the ADT should be 30,000 not 15,000. This ADT is referenced on Page 2-4. The term "moderate use sites" is not defined. Should this reference be to "high use sites"?

*RESPONSE: The subcommittee agreed to a lower standard for redevelopment projects than for new development projects. Since most road projects are redevelopment projects, this should not affect many projects. The ADT threshold will not change, but a definition of moderate use sites will be added to the glossary.*

- cc. Page 2-20, Treatment Facility Sizing. Agree with Ecology suggestion to change the wording to allow WSDOT to set its own preferred methods for sizing of facilities (follow-up communication after policy meeting on July 2). This should apply to both quality and flow control treatments. See below: "On p. 2-20 under "water quality design volume" the following sentence could be added to the end of the first paragraph:

Public road projects may be designed according to the revised [*should change "revised" in all these references to "current"*] WSDOT Highway Runoff Manual. The local jurisdiction may also allow design of individual projects per other approved stormwater manuals.

I also suggest deleting the word 'local' in the second and third sentences, so it reads: '*Each government should specify which of the following methods will be used in their jurisdiction. If the jurisdiction has not...*' (That would include WSDOT as a jurisdiction.)"

*RESPONSE: Agree to first change but because timing of HRM revision is uncertain, need a way to refer to that and future HRMs as opposed to the current HRM which would not be acceptable for this purpose. Will also note that the revised HRM must be approved by Ecology. For second change, suggest changing to "agency or local government" instead.*

- dd. Page 2-21, Snowmelt factor. Snowmelt from impervious surfaces should not be added into rainfall depths for calculating treatment volumes. There does not appear to be adequate methods for calculating the additional volume or flow rate associated with snowmelt, especially snow from impervious areas that has been plowed or piled. Much snowmelt occurs without rainfall. Adding snowmelt into the 6-month event changes the statistical recurrence interval and leads to over design of the facility. In Spokane snowmelt would increase the rainfall depth by more than 50 percent for the 6-month event. Snowmelt should not be under Core Element 5 if it is not required.

*COMMENT NOTED: There are areas of eastern Washington where snowmelt considerations are important because facilities are otherwise under-designed. A factor or other method of consideration can be required by a local jurisdiction.*

- ee. Page 2- 22. Agree with direction of Ecology's proposed changes: "On p. 2-22 under 'water quality design flow rate' the last, italicized sentence should be a new paragraph. Before that sentence in the first paragraph of the section, the following sentence could be added:

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Public road projects may be designed according to the revised WSDOT *Highway Runoff Manual*. The local jurisdiction may also allow design of individual projects per other approved stormwater manuals.

I also suggest deleting the word “local” in the second and third sentences, similar to the suggestion for p. 2-20.”

*RESPONSE: Same as for 16.cc above. Other issue is addressed in 4.d.*

- ff. Page 2-22, Water quality design flow rate. Method 1. Does the short duration event under *all* circumstances produce a higher flow rate than the SCS Type 1A or the Regional long duration event? We agree that generally (i.e., maybe 99 percent of the time) this is true. However, the longer duration storms should be checked. This is especially true if there are multiple basins contributing to the facility and large differences in time of concentration.

*RESPONSE: Will add a note that for large regional facilities receiving inflow from multiple sources, both storms should be checked.*

- gg. Page 2-22, Bypass Requirements. The bypass requirement should be eliminated. Where does the 2 ft/s figure come from? BMP T5.40 states to check for shear stresses. WSDOT thinks that the 2ft/s should be dropped. This check should be included in the design criteria for the individual BMP.

*COMMENT NOTED: Bypasses are necessary to protect many types of facilities from damage during higher flows. 2ft/s is indicated as “typical” and the section refers the designer to specifications for an individual BMP.*

- hh. Page 2-23. The level of treatment for water quality states at least 90 percent, but in Chapter 1 there are two standards, 90% or the first flush. Should the first flush also be stated here?

*RESPONSE: Will add statement that facilities designed in this manner should also capture and treat nearly all of the first flush events. See also 16.j4 under Chapter 5.*

**18. Spokane County (August 25)**

- l. Section 2.2.5, Core Element No. 5, under Definitions, Page 2-16: Our notes from the Manual Subcommittee Meeting of April 17<sup>th</sup> indicate that a definition (and possibly schematic or diagram) would be provided that delineated the difference between a paved or gravel shoulder (which requires treatment) and the subgrade in-slope, which should not. It was understood and agreed that the volume of runoff from the entire area must be accommodated, but only the areas that receive regular vehicular traffic needed treatment.

*COMMENT NOTED: The wording in the final draft was changed to address the concern. In-slope areas were added to the NPGIS definition and shoulders still are, as intended, subject to vehicular traffic and included in PGIS.*

- m. Section 2.2.5, Core Element No. 5, under Metals Treatment Exemptions, Page 2-18: In the middle of the paragraph, should it say “Discharges to subsurface...” versus “to groundwater” ?

*RESPONSE: Change to “Subsurface discharges...”*

- n. Section 2.2.5, Core Element No. 5, under Metals Treatment Requirements, Page 2-19: Should the third bullet read “highway” instead of “freeway” ?

*COMMENT NOTED: This is the same terminology used in the Redevelopment section. Should remain consistent.*

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- o. Section 2.2.5, Core Element No. 5, under Oil Control Requirements, Page 2-19: Is there a definition for Oil Control that the reader can find above?  
*COMMENT NOTED: High-use sites are defined "above."*
- p. Section 2.2.5, Core Element No. 5, under Treatment Facility Sizing, Method 1, Page 2-20: It was our understanding that although the short duration and second hump of the regional storm could still be utilized, per Tony Righellis' recommendation it would not be as the default.  
*RESPONSE: See 11.j.*
- q. Section 2.2.5, Core Element No. 5, under Treatment Facility Sizing, Method 3, Page 2-20: Verify that the BMP referred should be T5.30, not T6.30.  
*RESPONSE: Change to T5.30.*
- r. Section 2.2.5, Core Element No. 5, under Treatment Facility Sizing, Page 2-22: Just before 'Bypass Requirements' the requirement under "For runoff treatment facilities sited downstream of detention facilities:" could be worded better.  
*COMMENT NOTED.*
- s. Section 2.2.5, Core Element No. 5, under Use of Existing Wetlands..., Page 2-23: Does this mean that at no time can a higher quality wetland (i.e. Category 1 or 2) could be utilized for even some level of stormwater disposal? If development is allowed to occur around the buffer area of a wetland, and all runoff is restricted from reaching the wetland, the wetland will die at the hands of being "protected." Maybe something generic could be inserted at the end of this section to state that stormwater rates and volumes at pre-developed conditions are necessary to ensure the life of a wetland, but that in order to develop within the proximity (?) of a Category 1 or 2 wetland requires approval from and coordination with, Ecology. Core Element 6 has a paragraph that seems to elude to this same idea (Page 2-25, 3<sup>rd</sup> pp).  
*COMMENT NOTED: This section in CE 5 addresses whether a wetland can be used as a treatment facility. Flow should be directed to the wetland following appropriate treatment and source control. CE 6 does not contradict this.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- c. Stormwater Facilities – 2.2.5 and 2.2.6 - Core Elements. In discussions with those preparing this Manual, we understand that Section 2.2.5 and Section 2.2.6 determine whether a UIC facility is subject to the provisions of this Manual. We further understand that if a vehicle recycling facility that does NOT have fluids removal or parts removal activities exposed to stormwater and the facility has less than 10,000 square feet of impervious surface, the facility is not subject to other provisions of this Manual. Recommendation: Clearly set out specific exemptions for stormwater management facilities in Section 2.2.5 and Section 2.2.6 so lay persons reading this manual can determine if their UIC facility is exempt or not. Comment: We support the position that a vehicle recycling facility that does NOT have fluids removal or parts removal activities exposed to stormwater and the facility has less than 10,000 square feet of impervious surface, the facility is not subject to other provisions of this Manual.  
*COMMENT NOTED.*
- d. Stormwater Facilities – 2.2.5 - Core Elements. A definition of "high use site" is included in this section. From discussions with those preparing this Manual, we

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understand that a vehicle recycling facility that does NOT have fluids removal or parts removal activities exposed to stormwater is not a high use site.

Comment: We agree with that position.

*COMMENT NOTED.*

Core Element 6

**2. Public workshops (June 23-26)**

- i. Regarding the revised requirements for flow control, per Core Element #6, it seems like there are too many exemptions.

*COMMENT NOTED: The list of exemptions is based on a preliminary analysis of the stream order per the scientific recommendation of our consultant.*

**4. Department of Ecology (July 30)**

- i. The list of exempt rivers on p. 2-27 contains two errors which probably arose from a mistake in correcting an earlier version that listed the Wenatchee River below Eagle Creek (which flows into Chumstick Creek, not the Wenatchee River): the Methow River should be exempt below Early Winters Creek, and the Wenatchee River should be exempt below Icicle Creek.

*RESPONSE: Will make the changes.*

**5. Low Impact Development Center (August 11)**

- a. It might be worth mentioning that, in general, to meet a given peak flow control target, the optimal placement of multiple small-scale retention/infiltration facilitates within a drainage area will require less total storage capacity than a detention pond that might otherwise be used at the drainage area outlet. We have a paper in the works to describe the basic design concept. A draft manuscript should be ready in a few days if you wish to review a copy.

*RESPONSE: Will add the suggested note.*

**9. City of Spokane (August 20)**

- c. Page 2-29, first paragraph reference to regional storm, chapter 4 not only refers to the regional storm but other acceptable storms. This should be a more generic reference. see the six options on Page 4-3.

*RESPONSE: Several options are available for sizing treatment facilities but only one is allowed for sizing flow control facilities. Will ensure that consistent terminology is used in Chapters 2 and 4. See 11.j under CE 5. Also see 11.p; 16.nn, pp and qq; and 18.v under CE 6.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- l. Section 2.2.6, page 2-25: Provide a note to check with local jurisdictions and/or watershed plans to determine whether streams are suffering from low instream flows.

*RESPONSE: Will place a note in the Supplemental Guidelines for jurisdictions to undertake basin planning to address the question of whether low streamflow problems may be aggravated by flow control requirements for certain streams.*

- m. Section 2.2.6, page 2-26: Under exemptions 6B, replace the terms sensitive area with critical area.

*RESPONSE: Will change to "sensitive or critical area."*

- n. Section 2.2.6, page 2-26: Strike "1.5 to" in paragraph under paragraph 6.d.

*COMMENT NOTED: Scientific basis for 1.5-2 year range.*



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- o. Section 2.2.6, page 2-27: In the list of exempt surface waters, the Wenatchee River does not have a confluence with Eagle Creek. We suggest the Wenatchee River be exempt downstream of the Lake Wenatchee.  
*RESPONSE: See comment 4.i above.*
- p. Section 2.2.6, page 2-28: Revise bullet #9 to state “.runoff carried by the stream following the 2-year Type 1A or regional storm must not...” A number of occurrences of “regional storm” in this section should be modified to include the Type 1A storm.  
*RESPONSE: Bullet will be modified to address changes agreed to for 11.j under CE 5. See 9.c; 16.nn, pp. and qq; and 18.v under CE 6.*
- q. Section 2.2.6, page 2-28: Under hydrologic analysis the use of the pre-developed conditions contradicts the definitions for pre-developed and existing conditions provided in the glossary.  
*RESPONSE: See 11.d under Chapter 1.*
- r. Section 2.2.6, page 2-30: In the last sentence of the second paragraph strike “or retain”.  
*RESPONSE: Comment refers to second paragraph under supplemental guidelines. Will change “or retain” to “no more than.”*

**16. WSDOT (August 25)**

- ii. Page 2-25, Exemptions. The wording of exemption #1 is very confusing, "Any project that does not discharge runoff to a non-exempt surface water either directly or via a conveyance system." There are too many negatives being used to explain when something is not required. During what design event is the discharge, or lack thereof, calculated?  
*RESPONSE: Because the exemption is so obvious (flow control is only required for projects with discharges to surface water that aren't otherwise exempt), it should be dropped to avoid continuing confusion. See also 18.t.*
- jj. Page 2-25. Under the flow control Core Element #6 there are no design methods stated. It is not apparent what the standard should be as long as half the 2-year and the 25-year preexisting conditions are met. If a jurisdiction wants a check at the 100-year event, is that fine? Add a section of treatment Facility sizing similar to Core Element #5 or remove that section from Core Element #5 to be consistent.  
*COMMENT NOTED: Guidelines for CE 6 begin on p. 2-28.*
- kk. Page 2-26. Need an exemption for existing and or minor increases in discharge to commercial agriculture and/or timberland. Stormwater controls should not be required for most rural areas in eastern Washington.  
*COMMENT NOTED: These discharges must meet the requirements for natural dispersion in order to be exempt from flow control requirements.*
- ll. Page 2-28, #8 and #9. This will be hard to define but is worth a try do develop methodology. Exemption 9 is confusing. The previous terminology was clear with defining the stream systems as intermediate and perennial systems.  
*COMMENT NOTED: Subcommittee felt that intermittent, ephemeral and perennial were not widely understood terms.*
- mm. Page 2-28, Guidelines. Need to define "extremely low discharge rates" or eliminate it in the sentence: "In order to prevent localized erosion, energy

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*dissipation at the point of discharge is required for all projects unless site specific conditions or extremely low discharge rates warrant an exemption". Discharge would be part of the "site-specific conditions". Change the sentence to read: "In order to prevent localized erosion, energy dissipation at the point of discharge is required for all projects unless site specific conditions warrant an exemption."*

*RESPONSE: Agree to make change.*

- nn. Page 2-28, Hydrologic Analysis. The various options for this core element listed in Chapter 4 should be listed in Core Element #6 similar to the methods listed in Core Element #5.

*RESPONSE: See 11.j under CE 5. See also 9.c, 11.p, 16.pp and qq, and 18.v under CE 6.*

- oo. Page 2-28. The pre-developed definition: "*Pre-developed conditions are those that currently exist at the site unless the local jurisdiction has imposed other requirements*", does not account for land conversion provisions stemming from forest practices (see page 2-7, Forest Practices). This may imply that developers do not have to consider forested ground cover as the pre-developed condition once they exercise the land conversion option provided by a forest practice permit. Recommend that this should be clarified in the core element.

*COMMENT NOTED: This is clarified in the exemptions section, chapter 2.1.3.*

- pp. Page 2-29, Application to Non-Exempt Streams. Change "regional storm" to "design storm" or "design event". Also see 9.c, 11.p, 16.nn and qq, and 18.v.

*COMMENT NOTED: There is only one design event option for flow control.*

- qq. Page 2-29. The application to non-exempt streams refers to the regional storms, thus is this the standard method that should be used for flow control? If so, it does not state the duration?

*RESPONSE: The terminology in Ch 2 and Ch 4 needs to be reconciled and added to the glossary. The long-duration storm refers to the two-hump custom storm developed by Mel Schaeffer. The regional storm refers to the second hump of the long-duration storm. The custom storm refers only to a storm developed by a local jurisdiction using historical data. The short-duration storm is the 3-hour thunderstorm developed by Mel Schaeffer. The SCS Type IA and Type II storms are self-explanatory. Also see 9.c, 11.p, 16.nn and pp, and 18.v.*

- rr. Page 2-30, Supplement Guidelines. Regarding the evaluation of the substrate of a stream to determine whether the requirement to release the post development flows needs more guidance. A half-mile evaluation of the substrate is a large undertaking. We feel that a one quarter-mile evaluation is adequate. What is the level of modeling efforts required, or is there a process? Several studies and findings have been listed, but there is not a real set guidance or a preferred method.

*RESPONSE: This guidance may be refined after more experience is gained; the process will likely be undertaken only for a significant project or by a jurisdiction undertaking basin planning. No justification is provided for reducing the reach length evaluated. One-quarter mile is not sufficient to determine possible downstream effects of increased streamflows. Will add a*

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*note that the focus of the study should be on evaluating the erodibility of the substrate downstream to at least the next significant inflow for a minimum distance of half a mile.*

- ss. Page 2-30, 31, Supplemental Guidelines. *"Local jurisdictions may adopt a conservative, restricted set of curve numbers for estimating pre-development runoff."* Why would a local agency desire to do this? There should be some level of uniformity with the basic input parameters for hydrologic analysis. This question also applies to all of the other variations identified in this section that could be imposed by a local jurisdiction. It is assumed that this latitude given to a local agency is subject to certain formalized controls consistent with and specific to basin planning techniques. In other words, if they have not gone through the steps necessary to adopt a formal basin plan or critical area ordinance then any variations would be considered capricious, arbitrary and inconsistent with RCW 36.70A.172 and WAC 365-195-900.

*COMMENT NOTED: The subcommittee discussed this at length in revising the first draft of the Manual. Sufficient data may exist in some areas to identify and justify the application of pre-developed, native vegetation conditions or other more restrictive conditions. Where protection of local streams is a high public priority, basin planning will probably be undertaken to address this.*

- tt. Page 2-31, 2nd to last paragraph on additional exemptions. Should not restrict additional exemptions simply as a function of natural vegetative cover. Allowances should be made to apply this methodology to the vast areas of agriculturally zoned land in eastern Washington. Dispersion cannot be done as outlined in the BMPs unless one controls the land, however tort law already exists to protect down gradient property so it should not matter who controls the land. WSDOT suggests using the five percent manmade impervious (or better yet 10 percent) as the only criteria. If the impervious area is minimal then dispersion would work, however in a highway setting it is impractical to reserve 90 percent of the road right-of-way for vegetation. A more pragmatic solution is to allow dispersion (which with proper infiltration, requires no additional quantity treatment) if manmade impervious area is less than ten percent of the contributing basin at the ultimate surface discharge point. This approach would foster greater use of dispersion and infiltration as the preferred approach rather than promoting the collection and then conveyance of discharges.

*COMMENT NOTED: Because the project proponent has not control over the future use of agricultural land, other considerations must be taken into account when applying natural dispersion in those areas. This concept will be further explored and appropriate conditions identified for road projects during the development of the revised Highway Runoff Manual.*

**18. Spokane County (August 25)**

- t. Section 2.2.6, Core Element No. 6, under Exemptions, Page 2-25: Item No. 1 is still awkwardly worded. Since it is not clear what is meant, no alternate wording is offered.  
*RESPONSE: See 16.ii.*
- u. Section 2.2.6, Core Element No. 6, under Exemptions, Page 2-26: Our notes show that Item 6a (previously 7a) was going to be revised (by Karen Dinicola,

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Steve King and Heather Ostenson) to allow for natural versus pipe discharge. No change is apparent.

*COMMENT NOTED: Item 6b was revised to address the issue.*

- v. Section 2.2.6, Core Element No. 6, under Exemptions, Page 2-28: Does the term “regional” refer to the custom design storms or the SCS Type IA? Per Chapter 4, it appears that the term “regional” storm refers to the second hump of the custom storms. It is our understanding that utilizing the custom storm was not the preferred recommendation (per Tony Righellis), but it was conceded that using a portion of it would still be kept as an option; if the “regional” storm is the only storm allowed for flow control, then this seems to go against the recommendations of the consultant. Our notes from the Manual Subcommittee Meeting/Presentation on April 17, 2003 indicate that it was agreed by all that the Type IA would be “the” design storm for flow control, since they so closely mimic each other.

*RESPONSE: See comment 11.j under CE 5. Also see comments 9.c; 11.p; 16.nn, pp and qq under CE 6.*

- w. Section 2.2.6, Core Element No. 6, under Application to Non-Exempt Streams and Application to Wetlands and Lakes, Page 2-29: These two applications only “allow” for the use of the “regional” storm. Section 2.2.6, Core Element No. 6, Supplemental Guidelines, Page 2-30: Our notes indicate that the second paragraph would be moved up into the Guidelines.

*RESPONSE: For the second part of the comment, the paragraph will be moved to both sections on application to non-exempt streams and to wetlands and lakes on p. 2-29. See 18.v for first part of comment.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- c. Stormwater Facilities – 2.2.5 and 2.2.6 - Core Elements. In discussions with those preparing this Manual, we understand that Section 2.2.5 and Section 2.2.6 determine whether a UIC facility is subject to the provisions of this Manual. We further understand that if a vehicle recycling facility that does NOT have fluids removal or parts removal activities exposed to stormwater and the facility has less than 10,000 square feet of impervious surface, the facility is not subject to other provisions of this Manual. Recommendation: Clearly set out specific exemptions for stormwater management facilities in Section 2.2.5 and Section 2.2.6 so lay persons reading this manual can determine if their UIC facility is exempt or not. Comment: We support the position that a vehicle recycling facility that does NOT have fluids removal or parts removal activities exposed to stormwater and the facility has less than 10,000 square feet of impervious surface, the facility is not subject to other provisions of this Manual.

*COMMENT NOTED.*

*Additional comment made during preparation of response to comments:*

On p. 2-26, item 3 at top of page should refer to BMP T6.30 not T5.30.

*RESPONSE: Will make the change.*

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Core Element 7

**10. Yakima County (August 20)**

- q. Section 2.2.7, page 2-33, 4th paragraph – Clarify who will inspect and enforce O&M for private facilities. We understand that inspection and O&M of public facilities is done by local jurisdiction.

*COMMENT NOTED: This is addressed somewhat in “Responsibilities of Local Jurisdictions” which is intended for generic guidance only. It is not appropriate for the Manual to dictate who will enforce the core elements.*

Core Element 8

**16. WSDOT (August 25)**

- uu. Page 2-34, CE#8 Guidelines. The phrase in the first sentence of the first paragraph “or for any other purpose” is too broad and should be deleted.

*COMMENT NOTED: It would be presumptive to think we have listed all cases relevant to stormwater management.*

- vv. Page 2-35, Section 2.3.1. Financial Liability: Rewrite first sentence to read “... for all private development projects...” Bonding is not required for public works projects.

*RESPONSE: Agree to make change.*

- ww. Page 2-35. Per Ecology’s suggestion following up on our July 2 meeting, a new bullet should be added between the first and second bullets at the top of the page:

“Jurisdictions may have interconnected storm sewer systems. Neighboring jurisdictions are encouraged to work together to establish consistent design criteria for stormwater facilities since the climatic, geologic and hydrologic variation among neighboring jurisdictions is likely to be minimal. Where municipal separate storm sewer systems are interconnected between jurisdictions with different requirements, the downstream jurisdiction’s requirements apply.”

This should help out with local jurisdictions that have different requirements.

*RESPONSE: Agree to make change.*

**Chapter 3**

**10. Yakima County (August 20)**

- s. Section 3.2.1, page 3-3, Drainage Report – Should drainage reports be stamped by a P.E.? I think that if there are calculations needed then it should be stamped. I think the statement on the geotechnical engineer is appropriate.

*RESPONSE: The phrase “and stamped by a P.E.” will be added to the end of the first sentence in the first paragraph of the Drainage Report section on p. 3-3.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- s. Section 3.2, page 3-2: Revise bold statement in the middle of the page to “Downstream Analysis and Mitigation Procedure (for projects discharging off-site)”.

*RESPONSE: Agree to make change. See also 18.y.*

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- t. Section 3.2, page 3-4: Revise second line to state "... by a geotechnical engineer or licensed geologist."

*RESPONSE: Agree to make change, and further specify: Licensed Engineering Geologist.*

**16. WSDOT (August 25)**

- xx. Appendix 3A – Downstream Analysis. Provides a good step-by-step process for a qualitative analysis, but it breaks down for the quantitative process. A preferred method should be referenced to provide the detailed steps, and design or modeling efforts needed, for this level of analysis.

*COMMENT NOTED: Method will depend upon site and problem identified. Leave to best professional judgment and local requirements.*

**18. Spokane County (August 25)**

- x. Section 3.2.1, Stormwater Site Plans, Page 3-2, Step 1: Add this or similar information to bulleted list (these are limitations to stormwater design too):
- Adjacent properties and/or projects that have a historical record of stormwater problems in the past, noting if the cause of the problem has been determined.
  - Adjacent properties and/or projects who's geotechnical investigations have revealed shallow bedrock, high groundwater, seasonally perched groundwater, or clay lenses in the substrata.

*RESPONSE: Agree to make additions (change "who's" to "where").*

- y. Section 3.2.1, Stormwater Site Plans, Page 3-2: Revise bold heading to "Downstream Analysis and Mitigation Procedure (for projects with surface discharge or projects in areas where subsurface discharge is known or suspected to have caused problems)." This could be revised; our point is to make the reader aware that choosing subsurface disposal versus surface release does not mean that a downstream study is not required. It is our experience that in certain areas, subsurface injection of stormwater runoff can cause severe basement flooding and/or springs to pop up on downstream slopes. In keeping with this, the sentence that starts out "Projects that do not discharge stormwater offsite..." should be deleted.

*RESPONSE: Agreed. See 11.s.*

- z. Section 3.2.1, Stormwater Site Plans, Page 3-3, Step 3: The second website says "File Not Found."

*RESPONSE: Will correct the website address or identify a replacement.*

- aa. Appendix 3A, Downstream Analysis, under Guidelines, Page 3A-1: In the second sentence, insert after the word "volumes," "increases in stormwater injected into the subsurface."

*RESPONSE: Will make the suggested change (include "volumes of").*

- bb. Appendix 3A, Downstream Analysis, under Guidelines, Page 3A-1: Add a bullet that reflects the statement made in the last sentence of the 'Objective,' regarding aggravating an existing problem.

*RESPONSE: Will add a bullet.*

- cc. Appendix 3A, Downstream Analysis, Task 2, Page 3A-1: Add a sentence, or something similar to: "Consult with local jurisdiction for assistance in locating

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historical data.”

*RESPONSE: Will add the sentence.*

- dd. Appendix 3A, Downstream Analysis, Task 3, Page 3A-2: Change the word “should” to “must” or “shall” with respect to the design engineer physically inspecting the site and systems. There is no better source that the site itself to reveal stormwater conditions, as well as, it seems inappropriate for a design engineer to prepare a Downstream Analysis without having visited the site.

*RESPONSE: Will change to “must” and allow site visit by LEG instead.*

**Chapter 4**

**5. Low Impact Development Center (August 11)**

- a. It might be worth mentioning that, in general, to meet a given peak flow control target, the optimal placement of multiple small-scale retention/infiltration facilitates within a drainage area will require less total storage capacity than a detention pond that might otherwise be used at the drainage area outlet. We have a paper in the works to describe the basic design concept. A draft manuscript should be ready in a few days if you wish to review a copy.

*RESPONSE: Agree to include the note.*

**9. City of Spokane (August 20)**

- d. Page 4-9, last paragraph, reference where to find the Antecedent Moisture Condition discussion.

*REPSONSE: Agree to include reference to page 4-35.*

**10. Yakima County (August 20)**

- t. Chapter 4 – Hydraulic Analysis and Design: General comment - The technical information is excellent and the manual subcommittee and its consultants should be commended. There are little studies in the past conducted in Eastern Washington. As more information is collected in Eastern Washington, it is appropriate to update the information at the next update of the manual.

*COMMENT NOTED: Thank you.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- u. Chapter 4: It was understood that based on the manual subcommittee meetings that a brief narrative would be provided describing both the work performed by Tony Righellis and Mike Brunfelt. The final draft only contains information from Mel Schaefer in the appendix. It is important to provide the manual readers information explaining the basis for the material presented and what work was performed as part of the manual development.

*RESPONSE: Will provide the additional background and context and add to the appendix.*

- v. Section 4.2.1, page 4-4: This section states the Type IA storm is applicable to Western Washington and the eastern slopes of the Cascades. Clarify that this statement is based on original SCS maps and not the work performed during the manual development.

*RESPONSE: Agree to edit paragraph to address concern.*

**16. WSDOT (August 25)**

- yy. Chapter 4 Overall comment – This chapter is very chopped up and does not flow well.

*COMMENT NOTED.*

- zz. Page 4-2. Table 4.1.1 is not very easy to read. Furthermore, in the first column, the SBUH is listed but it is not listed anywhere before in the core requirements as a desired hydrology method. Suggest subheadings under each method to provide better understanding of information.

*COMMENT NOTED: Hydrologic analysis methods are not specified in Chapter 2.*

- aaa. Page 4-3, last sentence of Section 4.1.4. The manual should be more specific in describing exactly the type of control local jurisdiction have. This comment applies to other areas of the manual as well.

*RESPONSE: Changes will be made consistent to those agreed upon for Chapter 2. It is not appropriate for Ecology or the Manual to make statements about the regulatory relationship between WSDOT and local governments.*

- bbb. Page 4-3, Section 4.2. Design storm options should be modified to include the short-duration design storm if the regional long-duration or SCS Type 1A are used. The options should be:

Option 1: Regional long-duration storm distribution and the short-term distribution.

Option 2: SCS Type 1A storm distribution and the short-term distribution.

Option 3: SCS Type 2 storm distribution

Even though individual BMP design may not be cross-dependent, if an organization decides to select either the regional storms or the SCS Type 1A as their default method over the SCS Type 2, then the short-term event must be included in their package of tools for design of flow based BMPs.

*RESPONSE: We will clarify that Options 1 and 4 are not options to be used for detention pond analysis and you would need to use the appropriate storm distribution for your location as identified in Core Element 6. Will also note that the effect of the short duration storm should be considered.*

- ccc. Section 4-2 should have one graph with the four major storms on it so one can visually see the difference.

*RESPONSE: We agree and will include such graph, if possible.*

- ddd. Page 4-3. When defining the storm, the duration should also be stated, if it is a 3-hour, 24-hour, or longer.

*RESPONSE: We agree to include the durations.*

- eee. Page 4-6 and 4A-2, Region 1-4. These pages contain the same region explanations, but the information is not consistent. For example is Region 2 bounded to the North and East by the 12- or 14-inch contour line? Region 3 indicated 12-inch on page 4-6 and 14-inch on page 4A-2. Which is correct? Rather than repeat the information, it should be put on one page and reference it in the other section.

*RESPONSE: We agree that the information must be corrected but do not, however, agree with putting them on one page and referencing them in the other section.*



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- fff. Page 4-7. The short-duration storm should include more information on how to use this unit hyetograph. Is there a standard preference for the SCS or SBUH method? What hydrograph interval should be used? Is there a certain loss method that is better than another for this approach? This information should be stated in the long-duration storm as well as how to use them appropriately. Example problems would be nice, however they do not need to be in the manual if they can be posted on Ecology's website.

*COMMENT NOTED: Section 4.6.1 has the design procedures for flow control and treatment. Agree that design example(s) would be desirable to have and may be generated in future subject to the availability of time and resources.*

- ggg. Page 4-8 & 9. The explanation of the long-duration storm that the smaller events (from 6- to 21-hour) is insufficient to generate runoff, not necessary to directly model the smaller precipitation events, and contradicted in the next page. It states that "prior soil wetting produced by the smaller storm event (from 6- to 21-hours) that is not modeled needs to be accounted". If it is insufficient as stated in the previous page, it is a minor amount, thus it is not necessary to be accounted for. Why truncate a hyetograph and then make modifications to it for the section that was cut out? A better explanation of why this is being done is needed.

*RESPONSE: There are no contradictions but agree that clarification is needed. The smaller event will not be modeled but will be accounted for by adjusting the antecedent conditions per Tony Righellis's recommendations which will be explained in more detail in the final Manual.*

- hhh. Page 4-9, first paragraph. Add a reference to *Table 4.2.10*. Last line should read, "...as indicated in *Table 4.2.10* for Regions 1, 3, and 4..."

*RESPONSE: Agree to make the change.*

- iii. Page 4-9. An example on the curve number adjustment would help out since it is not very clear for designers who are unfamiliar with the antecedent moisture conditions. Reference the latter section in Chapter 4.

*RESPONSE: We agree. This could be part of the clarification in the response to comment ggg above.*

- jjj. Page 4-9, Long-Duration Storm. Top of page, second line should reference either *Tables 4.2.5 to 4.2.8* or *Table 4.2.10* for region adjustment factors from 24-hour to long-duration hyetographs.

*RESPONSE: Agreed to add a reference to Table 4.2.10.*

- kkk. Pg 4-9, last paragraph. Add a reference to page 4-35.

*RESPONSE: Agree to add the reference.*

- lll. Page 4-18, first paragraph. Does the reference to Generalized Extreme Value add any value (general comment as this is used elsewhere also)? Keep in the appendix, but do not need in text.

*COMMENT NOTED: We may move this in revising the appendix.*

- mmm. Page 4-18, last two paragraphs. The short-duration event is three hours long not two. Review paragraphs and make the appropriate changes.

*RESPONSE: Agree to review paragraphs and make the appropriate changes.*

- nnn. Page 4-19, *Table 4.2.11* and the sentence below. Change title to "3-hour" not 2-hour. Put this sentence right below table with an asterisk to make it stand out,

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or add a column for it in the table.

*RESPONSE: We agree to make both suggested changes.*

- ooo. Page 4-21, Calculating Rain-on-Snow Volume (Center for Watershed Protection). This is a very complicated procedure and is not well written or explained. Data requirements are enormous. All these methods for both rain-on-snow and snowmelt are dubious at best in Eastern Washington. How does adding snowmelt or rain-on-snow effect the statistical recurrence intervals that the rainfall statistics produce? The SCS loss method advocated in the manual specifically says: "Runoff from snowmelt or rain-on-frozen ground cannot be estimated using these procedures" (TR-55 Second Ed. Pg 2-11). How does plowing snow from or compacting snow on roadways effect melt? If rain on snow with frozen ground is a design-event, then it should be used for preexisting conditions. How does the runoff produced by this event differ from rain on pavement? WSDOT agrees that snowmelt from large natural areas affect runoff rate and volume. However, the question remains as to whether runoff rates higher on small urban watersheds from this event then from the short-duration rainfall event? There are many unanswered question on the relationship between rainfall, snowmelt and runoff in Eastern Washington.

*RESPONSE: We will consult the author of this section and acknowledge any shortcomings versus the advantages of the Rain-on-Snow procedure.*

*Subcommittee members noted that this duration coefficient is appropriate because rain-on-snow events occur over a longer period of time. Text does say this 2 paragraphs later but uses different words. Will try to clarify.*

- ppp. Page 4-23, Table 4.2.13. What does the column entitled "24-hour/72-hour..." represent? Was it ever explained?

*RESPONSE: Will check with the author to find out whether or where it may have been explained.*

- qqq. Page 4-24. The rain-on-snow consideration design methods are very confusing and complex as stated. Simple example problems would be helpful if a project is going to use one of these methods.

*COMMENT NOTED: We may provide examples as time and resources allow.*

- rrr. Page 4-26, Figure 4.2.5. The quality of this chart is poor and it is difficult to read.

*RESPONSE: Will try to enlarge the fonts on the axes and the labels and use larger style points.*

- sss. Page 4-27, 2nd paragraph. Does that mean one has to do the calculation twice, once with rain and once with snow to see if one even needs it?

*COMMENT NOTED: The purpose is to compare a snowmelt event to a rainstorm.*

- ttt. Page 4-28, End of 2nd paragraph. Add "20 percent for 50-year and 25 percent for 100- year."

*RESPONSE: Agree to add with "should."*

- uuu. Page 4-28, last paragraph. A picture similar to the one used in WSDOT's Hydraulics Manual, page 2-12 would help to illustrate this concept.

*RESPONSE: If an electronic version of the image is provided to Ecology it will be considered.*

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- vvv. Page 4-29, Tt =. Add (to the end of this equation) " $= L^{1.5} / K(\Delta H)^{.5}$ ". Also define the terms and reference K to *Table 4.4.3*.  
*RESPONSE: Agree to include alternate form of the equation.*
- www. Page 4-33. Areas of basins should have a limit when these methods start to break down based on size.  
*RESPONSE: If specific suggested thresholds for this and other methods are provided we will include them here and in Table 4.1.1 on p. 4-2.*
- xxx. Page 4-35, 3rd paragraph. Reference the example on page 4-38.  
*RESPONSE: Will reference the example.*
- yyy. Page 4-38, Table 4.5.3. Provide an example for how to use this table and then reference in the text.  
*RESPONSE: The table is referenced on p. 4-36. However, we will switch the order of pages 4-36 and 37 to move the CN table earlier and keep the AMC discussion together.*
- zzz. Page 4-39, last paragraph. Change to read "Location: Ellensburg; Area Requiring Treatment: 4.5 acres; CN=98".  
*COMMENT NOTED.*
- a<sup>4</sup>. Page 4-40, Top of page.  $C_{wqs}$  values are in *Table 4.2.9* not 4.2.8. To be consistent, replace 24- to 72-hour Conversion Factor with 24 to long -duration storm. Replace *Table 4.2.11* with 4.2.10. Verify 1.19 is correct, the table says 1.0.  
*RESPONSE: Thank you for the corrections. Will make changes and correct math using appropriate conversion factor.*
- b<sup>4</sup>. Page 4-40, 2nd paragraph. Starts with Method 2, where is Method 1?  
*COMMENT NOTED: Method 1 was not included in the example, and is not the default method for Region 2.*
- c<sup>4</sup>. Page 4-41. It would be helpful to reference design process in the text prior.  
*COMMENT NOTED.*
- d<sup>4</sup>. Page 4-41, number 1. Says "Mean Annual Precipitation" and refers to Figure 4.3.1 where it is called "Average Annual Precipitation". This should be consistent.  
*RESPONSE: Agree to change to average in text, and strike "(MAP)".*
- e<sup>4</sup>. Page 4-43. Step 12 should be 6month –3-hour not 2-hour.  
*RESPONSE: Will make change.*
- f<sup>4</sup>. Page 4-42, number 15. – Change the sentence that starts "Keep running . . . ." to "Continue iterations utilizing the computer model . . . ."  
*RESPONSE: Will make change.*
- g<sup>4</sup>. Page 4-50. The hydrograph interval for the short-storms and long-storms are given under the SBUH method. Does that mean that is the preferred hydrology method to use?  
*COMMENT NOTED: There is no preferred methodology for single-event hydrologic analysis.*
- h<sup>4</sup>. Page 4A-1. *Appendix 4A* needs an introduction. The second sentence of the page repeats as the start of the last paragraph on page 4A-2.  
*RESPONSE: Will provide an introduction.*

- i<sup>4</sup>. Section 4C. Will these figures be larger and in color when the final manual is produced? In addition, the figures should be GIS based and text should be clearly readable when the figures are zoomed in on using a computer.  
*COMMENT NOTED: The final GIS maps will be made available on Ecology's website and included in the CD version of the Manual; the printed Manuals will include 11"x17" color printed versions.*

**18. Spokane County (August 25)**

- ee. Section 4.1.2, Hydrologic Analysis Methods and Applicability, Page 4-1: The statement that "Local jurisdictions may also approve custom local design storms that are based on local historical data and applied in a manner that meets the objectives..." of the Core Elements, seems to be exactly the reason we were not accepting of the initial custom design storm analysis prior to the peer review by Harper, Houf, Righellis. If this were an adopted manual at the time we were looking at the custom storms, no peer review would have been required. We feel that the Subcommittee should discuss this.

*RESPONSE: This statement does not belong in Chapter 4 and will be removed. Chapter 2 is the appropriate place in the Manual for such statements. Because no change to the wording on this topic in Chapter 2 was proposed, no change will be made to that Chapter. Several subcommittee members and other commenters wished to allow local jurisdictions to develop their own custom storms. Staff in the local jurisdiction would need to be certain that the methodology and data used were appropriate in meeting the intent of the Core Element.*

- ff. Section 4.1.2, Table 4.1.1, Page 4-2: Why is the reference to custom long duration storm still found in this table?

*RESPONSE: Will change last item in 1<sup>st</sup> row, 2<sup>nd</sup> column to read, "Some SCS Hydrograph models such as TR-55 are restricted to 24-hour hyetographs and will not allow other custom storm durations developed for eastern Washington based on local, historical precipitation data."*

- gg. Section 4.2, Design Storm Distributions, Page 4-3: Option 2, it appears that the term "regional" applies to the custom storms, thus the long-duration and short-duration references need to be consistent throughout document.

*RESPONSE: Agree to make certain that terminology is consistent throughout this chapter per response to comments on Chapter 2: the long-duration storm refers to the two-hump custom storm developed by Mel Schaeffer. The regional storm refers to the second hump of the long-duration storm. The custom storm refers only to a storm developed by a local jurisdiction using historical data. The short-duration storm is the 3-hour thunderstorm developed by Mel Schaeffer. The SCS Type IA and Type II storms are self-explanatory. We will also include the "modified Type IA storm" developed by the sub-consultant as an alternative regional storm (for regions 1 and 4, with a note that if the stream substrate is very erodible a lower percentage than 50% of the 2-year streamflow should be matched) to accommodate TR-55 and other software that requires a 24-hour storm. All will be added to the glossary.*

- hh. Section 4.2.2, Custom Design Storm Hyetographs, Page 4-6: The reference to "custom design storms" is inconsistent with previous references to "regional"

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and “long-duration” storm, and other various combinations of those terms. One term should be chosen.

*COMMENT NOTED: see comment gg above.*

- ii. Section 4.2.3, Storm Analysis, Page 4-7: Long-Duration Storm: Same comment as Item No. 5 above: choose one term.

*COMMENT NOTED: see comment gg above.*

- jj. Section 4.2.4, Precipitation, Page 4-17, third paragraph: It might be useful to mention what the 2 year recurrence interval for the 2 hour duration storm is used for (flow based water quality facility sizing).

*RESPONSE: Will add note that the 6-month recurrence interval for the 2 hour duration storm is used for flow-rate based water quality treatment facility sizing. The 2-year isopluvials are necessary because 6-month isopluvials are not available. The user must scale the 2-year depth to get a 6-month depth.*

- kk. Section 4.2.5, Precipitation, Page 4-17: title and references to long-duration storm: Same comment as Item No. 5 and 6 above: choose one term.

*COMMENT NOTED: see comment gg above.*

- ll. Section 4.2.8 Snow: Rain-On-Snow, Snow Considerations, Page 4-20: Last sentence: Shouldn't the term be “exacerbate” instead of “exasperate” ?

*RESPONSE: Thank you for the correction. Will make the change.*

- mm. Section 4.2.8 Snow: Rain-On-Snow, Snow Considerations, Table 4.2.13, Page 4-23: It is unclear what the reference to 72-hrs refers to in this table? With respect to the “long duration” reference, we make the same comment as Item No. 5, 6 and 8 above.

*COMMENT NOTED: see comment gg above.*

- nn. Section 4.5.3, Curve Number, third paragraph of Page 4-35: The hydrologic consultant, Tony Righellis, stated it should be taken into account that separating the hydrographs in a basin or sub-basin that has CN values which differ by 20 points or more is really only required in a situation such as when a parking lot and a park are side by side; in a residential subdivision, he stated that weighting the CN is appropriate as the surface areas are homogeneous, and do not need to be separated. We think a clarification should be made here, noting that the next paragraph begins to cover it.

*RESPONSE: Agree to insert a paragraph with the above considerations.*

- oo. Section 4.5.3, Curve Number, sixth paragraph of Page 4-35: Suggest to revise as follows: “Conditions where there is high groundwater and/or shallow bedrock can cause a significant increase in runoff. If either of these conditions exist, they need to be addressed by the design engineer.”

*RESPONSE: Agree to make the suggested change or an equivalent grammatical correction.*

- pp. Section 4.6.1, Hydrograph Design Process, process, Page 4-41 & 4-42: Consider making the process statements bold so that detention facility and/or water quality facility stands out in the text.

*RESPONSE: Will underline those two paragraphs for emphasis.*

- qq. Section 4.6.1, Hydrograph Design Process, process, Page 4-41: Step 4 should come before Step 3; without the basin boundaries you could not determine which soils were applicable to the project site. Step 7 should say “Verify that”

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instead of “Check.” And if Step 3 and 4 are reversed, Step 8 needs to be revised. Step 11 still contains references to qualifying for an exemption; we thought it was decided that legally there was no amount of increase in rate or volume that would be acceptable (without an easement). Clarify.

*RESPONSE: Agree to make suggested changes to steps 3, 4, 7, and 8. Assume that step 11 refers to a qualification for dispersion, rather than an exemption, but agree that if the runoff characteristics of the site do not change then no flow control facility would be required. Will change sentence to reflect these concepts.*

- rr. Section 4.6.1, Hydrograph Design Process, process, Page 4-43: Same comment as No. 13 above; respective Step No.’s would change.

*RESPONSE: Agree to make changes.*

- ss. Section 4.6.1, Hydrograph Design Process, process, Page 4-43: What is the proper term for the custom storm? Also, change “Check” to “Verify that.”

*COMMENT NOTED: see comment gg above.*

- tt. Section 4.6.2, Hydrograph Parameters: General Comment: It seems that Area and CN are also parameters, in that when a basin is established, these elements are as important as the time of concentration, etc. The flow of the Chapter seems odd to sandwich the design processes in-between two separate discussions of hydrograph parameters.

*COMMENT NOTED: The introductory paragraph for this section adequately explains where to find the other information.*

- uu. Appendix 4C, Precipitation Maps: The precipitation maps are still too small to read, thus they are too small to utilize for design. How will the manual be compiled when it is ready to be distributed? i.e., could the maps be 11 x 17? Or posted to Ecology’s website?

*COMMENT NOTED: The final maps will be made available on Ecology’s website and included in the CD version of the Manual; the printed Manuals will include 11”x17” color printed versions.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- e. Stormwater Facilities – Chapter 4 – Hydrologic Analysis and Design. This section of the Manual is incredibly complex and is effectively not useable for a layperson. Small facilities will have to spend hundreds, if not thousands, of dollars for a consultant to help them size their facility, dramatically increasing the cost of that stormwater facility. Recommendation: Provide a simpler and more understandable approach for laypersons to use for sizing of their stormwater management facility for a small business.

*COMMENT NOTED: Local jurisdictions may provide simple stormwater site plans for use by small businesses that would include basic facility design specifications.*

- 22.** Additional comment from 9/11 meeting: The isopluvial maps still need correction. Consultant team lead states that budget did not allow for corrections to be made; subcommittee countered that errors introduced by the consultant team should be fixed.

*RESPONSE: If the consultant team is unable to correct errors, Ecology will ask its GIS staff to make needed revisions to the maps. Ecology requests that interested*

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*parties who have commented on the failings of the current maps be available to staff working on the maps; members of the committee agreed to work with the GIS staff to fix the problem. The final maps will be made available on Ecology's website and included in the CD version of the Manual; the printed Manuals will include 11"x17" color printed versions. The consultant will forward background emails that will be helpful to the GIS staff.*

- 24.** Additional comment from 9/11 meeting: The consultant team lead had a list of other comments/items that still needed to be addressed or provided by others in the final draft Manual. Here is the status of the item that applies to Chapter 4:

- Maps – consider updating maps in Appendix 4C to provide more accurate locations for jurisdictions.

*STATUS:* See comment 22 above.

### **Chapter 5**

*(comments on Section 5.6 are addressed separately)*

**1. Rich Krenkel, Citizen (June 19)**

- a. One of the concerns I have are the swales that are built along roads that Spokane County has put in and also the ones on private business property. I would say about ¼ of the swales that I see do not work, especially if they were constructed a couple of years ago. What I am seeing is the grass sod has grown thicker in the water entrance way and is now too high to let water enter the swale. This is due to no one checking them after they have been installed for a few years. The initial inspection would not have to be done by a county or state employee but by a volunteer of an organization or by having a number the public could call to report a problem. I belong to the Spokane Canoe and Kayak Club and many members are concerned about water quality. The number could be listed in the newsletter and there are many other outdoor organizations that have newsletters that the number could be listed in.

*RESPONSE:* Will add a statement to the O&M requirements for BMP T5.30 noting the problems you have observed: a bullet will be added on p. 5-33 between the second and third bullets under "Additional Design Criteria..." which states that "A concrete or riprap apron shall be provided at the curb opening to prevent vegetation from blocking the inlet." Your suggestion as to a hotline number has been forwarded to Spokane County officials.

**4. Department of Ecology (July 30)**

- a. For high use roads (as opposed to high use intersections), specify in the treatment menu that oil control needs to be done using an absorptive surface such as a bioswale, catch basin inserts or perhaps the booms proposed by WSDOT – not using an oil-water separator, which would not be effective for these smaller quantities of oil. This applies to Chapter 2 redevelopment section and Core Element 5 water quality treatment, as well as in Chapter 5, specifically on pp. 5-6&7 and 5-10&11 (Figures 5.2.1&2), and in Chapter 5.6.

*RESPONSE:* Suggested changes need to be addressed in both chapters 2 & 5.

- h. Check to make sure Spokane bioswale design/sizing method is appropriately referenced in Chapter 5.

*RESPONSE:* BMP T5.30 is not correct. See 18.x.

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- k. In the Final Draft Stormwater Management Manual for Eastern Washington (June 2003), Dam Safety's jurisdiction over large stormwater impoundments is mentioned in Section 6.2, Detention Facilities, sub-section 6.2.1, Detention Ponds, on page 6-1; and in Section 5.7, Wetpool Facilities, sub-section 5.7.3, Design Criteria, Embankments, on page 5-65. The locations and text for these items are appropriate and adequate.  
*COMMENT NOTED: Thank you.*
- l. There is a typo on p. 5-59. The reference for detention ponds should refer to Section 6.2, not Section 5.2.  
*RESPONSE: Will make the correction.*
- m. Chapter 5.10 Oil and Water Separators needs revision because the June 2003 Independent Science Panel review of the Western Washington stormwater manual (page 8) found that oil/water separators are not effective in treating the low levels of oil in stormwater. We have seen worse results from the Pasco area where infrequent precipitation and occasional high flow thunder storms has resulted in pass-through of oil in the 100+mg/l range. This seems to be addressed in 5.10.6 Design Criteria (page 5-103) that states "There is concern that oil/water separators used for stormwater treatment have not performed to expectations." and "emphasis should be give to proper application, design, O&M.....", and in 5.10.4 that states "Without intense maintenance oil/water separators may not be sufficiently effective in achieving oil and TPH removal to required levels." However, this seems to just be a way to shift the blame for failure on design and maintenance when in reality the treatment goals may be unrealistic. This is significant when Ecology says a permittee is presumed to meet water quality standards if they follow the manual. More work is needed to either determine if and when oil/separators can meet design standards of (15 mg/l (grab) and 10 mg/l (24hr). page 5-102) and if maintenance expectations for the businesses listed are realistic. In the meanwhile, some statement like "Oil/water separators are not always effective in treating low levels of oil in stormwater, but do remove oil and sediment and have value in containing spills." may be useful.  
*RESPONSE: See 4.a above.*
- o. Chapter Five p. 5-107 The next to bottom bullet says "Inspect oil/water separators monthly during the wet season of October 1 - April 30". The wet season in eastern Washington is October 1 through June 30 on page 7-17. Change the date on page 5-107 to June 30.  
*RESPONSE: Will make the correction and confirm that the period is the same for all regions. In region 2, it is most important to check these facilities in the spring before the summer thunderstorm season begins. One annual check done at this time of year should be sufficient for oil/water separators in region 2.*
- p. On page 5-106, the 2.15 factor in the equation in the third part of the second bullet at the top of that page does not apply to eastern Washington; it is a correction factor based on continuous runoff modeling for western Washington.  
*RESPONSE: Will make the correction.*



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- q. On page 5-4, first paragraph, next to last line, change “discussed” to “discusses.”  
*RESPONSE: Will make the correction.*
- t. On pages 5-3 through 5-7, change letters to bullets in Step 1 and reorganize similarly to Core Element 4 in Chapter 2; suggest changing Step 2 to “Determine Receiving Waters and Pollutants of Concern”; Step 4 should refer to any combined flow control and basic treatment BMP; it would make more sense to switch Steps 3 & 4; on p. 5-4 eliminate the parenthetical, italicized notes and discuss in narrative instead.

*RESPONSE: Will (1) add dispersion; (2) delete step 4; (3) eliminate A,B,C,D numbering; and (4) eliminate the “no’s” between items now numbered A through D. See also comments 16.k4, m4, and p4.*

**9. City of Spokane (August 20)**

- e. Page 5-4, you may wish to be more specific in referring to infiltration treatment design criteria  
*RESPONSE: Will try to get the reader closer, but section 5.4.3 and 5.4.4 are still large sections. On page 5-27 the SSCs begin; maintenance criteria start on p. 5-30; and design criteria are provided in the BMPs (5-31 through 33).*
- f. Page 5-4, last paragraph, there is reference to guidance provided in Chapter 6. There is also guidance provided in Chapter 5. Please be more specific.  
*RESPONSE: should refer reader to section 5.6.*
- g. Page 5-11, Figure 5.2.2 under "Determine Pollutant Source and Loading", add (see Section 5.6.2) under "Determine Geologic Matrix and Depth to Ground Water", add (see Section 5.6.1) under Is "Treatment Required Prior to Discharge?", change (see Table 5.6.4) to (see Table 5.6.3)  
*RESPONSE: Will make corrections, but change Section to Table for 5.6.2&1.*
- h. Page 5-15, Table 5.2.4 there is an apparent conflict where Sand Filters says "Preferred" under Semi-Arid Watersheds on this page and Table 5.2.6 generally refers to Sand Filters as having poor applicability. Which is correct?  
*COMMENT NOTED: One table refers to arid weather considerations and the other to cold weather considerations, which may not be consistent.*
- i. Page 5-20 and 5-21, check all Section/BMP # - many of these are in chapter 5 and others appear to be mismatched  
*RESPONSE: Will double-check these numbers.*
- j. Page 5-22, Table 5.2.6, we need to see the Dry Ponds in order to review for accuracy and comment  
*RESPONSE: See last bullet under comment #24 at the end of this document.*
- k. Page 5-41, Plan View, note on right should read 18" for each 30' of contributing flow path (12" min) Section A-A, there should not be a 1" drop from the pavement surface to the flow spreader  
*RESPONSE: Suggest adding range (18" for each 30'-50') and making 1" drop optional.*
- l. Page 5-67, last sentence on page, where do we find dry ponds in this manual??  
*RESPONSE: See 9.j above and comment 24, last bullet.*

**10. Yakima County (August 20)**

- u. Chapter 5 – Runoff Treatment Facility Design: Section 5.2.1, page 5-5 – Suggest that you put the note “If Some or All Site Stormwater ...” in a text box to read it while reading Step 2. It could easily be missed.

*RESPONSE: See 11.x. This statement should be dropped from the text, not highlighted, as the following steps apply to other types of discharges.*

- ff. Section 5.7, page 5-58, Wetpool Facilities – May not be applicable to Eastern Washington and threat of mosquito breeding ground.

*COMMENT NOTED: Will work in some higher precipitation areas.*

- gg. Chapter 5, General Comment – the sources of tables and figures were not cited. Is this a copyright problem?

*RESPONSE: The consultant team lead will double-check these and reference any that were dropped from the first draft. Figures from public sources do not provide copyright problems but should still be referenced.*

- hh. Figure 5.12.4, page 5-121 – Hard to read. Source of the drawing?

*RESPONSE: Agree. Will enlarge the figure and identify source.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- w. Section 5.2.1, page 5-4: Revise the first sentence of the last of the paragraph to state “... subsurface infiltration facilities, such as drywells.”

*RESPONSE: Will make change, with “including” instead of “such as.”*

- x. Section 5.2.1, page 5.5: The italicized direction at the end of step 1 does not make sense. Please clarify.

*RESPONSE: Agree. See 10.u above.*

- y. Section 5.3.1, page 5-22: Under water quality design storm, include reference to Chapter 2, core element #5 as well as Chapter 4.

*RESPONSE: Will include references to Chapter 2.2.5 and Chapter 4.*

- aa. Throughout chapters 5 and 6: Include statement under these BMPs identifying them as UIC facilities. These facilities, if designed and constructed according to the manual, would be UIC rule authorized, requiring registration of the facility and other UIC rule associated compliance actions. It would be helpful if these facilities were noted as such.

*RESPONSE: This is a good suggestion. Will identify as suggested.*

**14. Stormwater Management Inc. (August 25)**

- c. Chapter 5 – Runoff Treatment Facility Design, Section 5.12.4 Testing Protocol: The Eastern Manual states: Other acceptable protocols may also be added to Ecology's web site. Such protocols may be developed by local, state, or federal agencies. Comment: Recommend revising sentence to state: “Other acceptable testing protocols may also be used that are deemed equivalent to the recommended Ecology testing protocol.” Rationale: Consistency with section 5.12.5 which states: “However, none of the submittals included performance information using the Ecology testing protocol, or equivalent protocol.” Ecology has a unique set of testing guidelines that are more stringent than any other testing protocol; therefore there currently is no equivalent. Additionally, for technologies going through the Ecology testing process, this would allow an unfair business advantage for those not using the more stringent Ecology testing protocol.

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*RESPONSE: Agree to make the proposed revision since the current protocol (TAPE) specifies applicability to both eastern and western Washington.*

- d. Chapter 5 – Runoff Treatment Facility Design, Section 5.12.5 Assessing Levels of Development of Emerging Technologies currently reads: Emerging technologies shall be used only within the application criteria and performance limits listed at Ecology’s web site. Best Professional judgment may be used in the interim until the Ecology-TRC process is operational. Comment: Recommend revising sentence to state: “Jurisdictions may use their best professional judgment for establishing a pilot level status for emerging technologies that follow the Ecology testing protocol.” Rationale: Ecology must maintain consistency in the interpretation of Ecology’s guidance document. Ecology currently has an active-TRC process in place for Western Washington that would be sufficient, if and when an Eastern Washington TRC is deemed necessary or if established. There is not a need to duplicate Ecology’s or the TRC efforts in reviewing emerging technologies.

*RESPONSE: Agree to make suggested revision.*

- e. Chapter 5 – Runoff Treatment Facility Design, Section 5.11.2 Metals Treatment: Stormwater Management Inc. requests that Stormwater Management StormFilter® be included in the metals treatment section as media filters using organic media. It has been demonstrated that organic media can remove dissolved metals through cation exchange and chelation mechanisms inherent to the media’s properties and that there is sufficient evidence to demonstrate that Ecology’s recommended treatment levels will be met for industrial and commercial sites. Please review the following supportive documentation for inclusion in the Eastern Washington Manual for metals removal:

- 1) [www.stormwaterinc.com/pdfs/Lenhart%20Soluble%20Metals.pdf](http://www.stormwaterinc.com/pdfs/Lenhart%20Soluble%20Metals.pdf)
- 2) [www.stormwaterinc.com/pdfs/verification\\_brief\\_2002.pdf](http://www.stormwaterinc.com/pdfs/verification_brief_2002.pdf) (pgs 24 - 25)
- 3) [www.dpo.uab.edu/~seclark/research%20proposal.htm#\\_Toc481551836](http://www.dpo.uab.edu/~seclark/research%20proposal.htm#_Toc481551836)
- 4) <http://www.parametrix.com/profile/pdf/StormConmediatest%20paper1.pdf>

*COMMENT NOTED: Conditional approval has been granted for basic treatment, and organic media are mentioned for metals removal. SMI should apply for a TRC and Ecology review based on the TAPE. StormFilter would be added to the Manual(s) following review and approval.*

**15. Building Industry Association of Washington (August 25)**

- g. Surface Infiltration Facilities: In many instances, surface infiltration is a logical and cost-effective option for stormwater disposal and treatment. However, the SMMEW, by imposing seven complex and expensive site-selection criteria (SSC), discourage the use of surface infiltration and has essentially made infiltration ponds, trenches, swales, and bi-infiltration swales into BMPs falling under the demonstrative rather than presumptive approach. Additional testing or research should be performed to support the seven SSCs from Section 5.4 for surface infiltration. In particular, SSCs 5-7 discourage surface infiltration systems because of cost and complexity. Rather, the Department could include surface infiltration alternatives and design guidelines, exempt from SSCs, in the manual. Such specified alternatives, like surface

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water infiltration ponds with sand/gravel layers, would more closely follow the manual's goal of providing presumptive stormwater management solution. Such alternatives would also provide added flexibility to builders, developers and property owners.

*COMMENT NOTED: We disagree. These criteria provide practical technical guidance to prevent problems that would be caused by siting infiltration facilities incorrectly. Neither are they new criteria; they are found in existing guidance for eastern Washington jurisdictions. Where project proponents believe they have a viable alternative, the demonstrative approach is available and should be used. Exceptions may be granted by local jurisdictions on a case-by-case basis.*

**16. WSDOT (August 25)**

j<sup>4</sup>. Page 5-2. The performance goal only states one standard level of treatment of 90 percent and not the first flush as stated in the first chapter.

*RESPONSE: See also 16.hh under Core Element 5. Will add statement that facilities designed in this manner should also capture and treat nearly all of the first flush events.*

k<sup>4</sup>. Page 5-3. The treatment facility selection process does not mention the use of natural dispersion as the preferred option. Projects on the eastside should not be collecting stormwater runoff in areas that can naturally sheet flow and disperse. Step 1 should be retitled to something like, "Determine How Existing Site Discharges Stormwater" in order to avoid suggesting to the reader that these are in order of preference for selecting a treatment facility. Of particular concern is that evaporation is listed first and suggests that no further steps in the process need to be examined. The actual order of preference would more likely be aligned with the sequence found on pages 2-13, 14, Core Element #4 Preservation of Natural Drainage Systems and consideration should be given to reorganizing the Step 1 sequence for consistency (Also modify flow chart on page 5-10. The first box should point to all boxes A through E, not just A, and eliminate "No" arrows that connect the A through E boxes.). In fact, it would probably be more straightforward to state upfront what the order of preference should be for selecting treatment facilities at the beginning of *Section 5.2.1*.

*RESPONSE: See comment 4.t.*

l<sup>4</sup>. Page 5-7, Note. Direct reader to a SC type oil water separator.

*COMMENT NOTED: This is the intent of the note.*

m<sup>4</sup>. Page 5-7, Step 4. This step is out of place. This is a treatment BMP, not a step in the design process. WSDOT has an actual BMP designed to do this (i.e., Ecology Ditch, Ecology Embankment), but it is not stated that a BMP of this design should be used to achieve this nor is there a specific BMP provided in the manual to do this. Also WSDOT does not think that this should be called "infiltration" as the water is collected and not fully disposed of by infiltration. We agree that this is a viable treatment BMP, but should be listed within the BMP section. The first treatment option should always be sheet flow and dispersion if possible.

*COMMENT NOTED: See comment 4.t.*

n<sup>4</sup>. Page 5-8, Step 6. Do not list sites where metals treatment is required.

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Refer to the Core Element #5, Section 2.2.5. This is what is done in the oil control and phosphate sections. Consistency is important. These sections are still making the assumption that "all" arterials and highways which discharge to fish-bearing streams, lakes, or to waters or conveyance systems tributary to fish-bearing streams or lakes require enhanced treatment. There should be some consideration given to exempt low-ADT highways from this requirement. This could be further supported by the fact that an application limitation is already being provided in the same paragraph which states, "For developments with a mix of land use types, the Metals Treatment requirement shall apply when the runoff from the areas subject to the Metals Treatment requirement comprise 50% or more of the total runoff within a threshold discharge area".

*RESPONSE: Will make changes to this section to be consistent with CE 5; this should have been done in the final draft manual. Need to eliminate any remaining references to "Threshold discharge area" in this Manual.*

- o<sup>4</sup>. Page 5-9, Step 7. Either list BMPs for all treatments (i.e., oil, phosphorous, metal) in each respective section or not. Be consistent.

*RESPONSE: Agreed. Will probably not list BMPs.*

- p<sup>4</sup>. Page 5-10, Figure 5.2.1 – BMP Selection Process. Remove Step 4 under middle column C "Surface Water". The Figure leads the designer to believe that this process is for both runoff treatment and flow control in one. Consider a project that has evaporation. It would be designed for both runoff treatment and flow control. If the project went to surface waters it only goes through the runoff treatment section and never states that flow control may be necessary. If the project is either surface or subsurface infiltration again it assumes that both runoff treatment and flow control are taken into account.

*RESPONSE: See comment 4.t.*

- q<sup>4</sup>. Page 5-11, Figure 5.2.2. This process should apply to surface infiltration for quantity also. If it works for sub-surface infiltration it should work for surface infiltration. If the treatment process within the vadose zone provides adequate treatment under a subsurface infiltration facility then it should also work under a surface infiltration facility.

*COMMENT NOTED: Disagree. Surface infiltration has different requirements.*

- r<sup>4</sup>. Page 5-12, Pollution of Concern, 2nd sentence. Table 5.2.1 does not suggest treatment options.

*RESPONSE: Agree. Will correct.*

- s<sup>4</sup>. Page 5-13. 1st bullet, Depth to Limiting Layer, 2nd second sentence. Should say "seldom suitable" as in High Water table not "is not suitable"

*COMMENT NOTED: Disagree. Subcommittee considered changing the seldom suitable for high water to not suitable but did not reach consensus on that change.*

- t<sup>4</sup>. Page 5-13, Table 5.2.1. Non-inert coated metal roofs. Add note.

*RESPONSE: Will add to table in row.*

- u<sup>4</sup>. Page 5-14, Table 5.2.3. Remove "Not Generally Appropriate." All ready covered with the "-".

*RESPONSE: Agreed. Will change.*

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- v<sup>4</sup>. Page 5-15, Table 5.2.4. Under “Bioswales” and Semi Arid. Add “or dryland grasses” after “limited use unless irrigated” or other such reference. Not all biofiltration swales need irrigation.  
*COMMENT NOTED: Dryland grasses are already allowed in the Manual (p. 5-36); this table is identifying the most proven methods. See also 18.d. Spokane County will provide Ecology with additional scientific justification for treatment effectiveness of dryland grasses.*
- w<sup>4</sup>. Page 5-19, Reduced Soil Infiltration, 3rd sentence. Infiltration is “less effective”, not “ineffective”.  
*RESPONSE: Will change to "can be ineffective" instead of "are ineffective."*
- x<sup>4</sup>. Page 5-22, On-Line Systems and Bypass Requirements. The on-line and off-line terminology should be in the core element since it is important information for the designer to know upfront. Why should a bypass or overflow provision be needed? What is the main objective or concern? The first design requirement states to determine the maximum allowable velocity that will not result in damage of the facility or dislodging of the pollutants from within it. There are several different checks in that first design criteria, in the previous chapter it first states that the velocity should be 2fps and now it states to check for a maximum velocity based on what criteria, erosion to prevent damage of the grass? The second check or design guidance is to figure out the dislodging of pollutants for what size and distance is a concern? If the pollutant moves five feet, is that a concern versus 50 feet? Again, what is the main objective of this criteria, the erosion or the dislodging of pollutants in fish bearing streams? Since the entire section on bypass requirements appears to only apply to BMP T5.40 “Biofiltration Swale” and is adequately covered there, it should be deleted or be modified to be less specific.  
*COMMENT NOTED: The on-line and off line terminology in section 5.3.1 applies to many treatment systems including bioswales, oil/water separators, sedimentation, filtration, vortex-based systems, etc. so present terminology will remain as is. The important this is to make sure that pollutants are not dislodged.*
- y<sup>4</sup>. Page 5-23, Summary of Areas Needing Treatment, 1st first bullet. Change to “... pervious areas may also . . . .”  
*COMMENT NOTED: The subcommittee discussed this during the last comment period and agreed that treatment facilities in residential areas needs to be considered due to potential fertilizer and pesticide concentrations in runoff.*
- z<sup>4</sup>. Page 5-24, Setbacks, 3rd bullet. Change “shall” to “should be located . . . .” Change “wetpond on a steep slope” to “facilities on a steep slope closer then above.” *RESPONSE: Will make the second suggested change since the geotechnical report is probably meant not only for wet ponds but for other facilities as well. But the "shall" is appropriate here as representing an example of a local government requirement. Will also underline “examples of...” on p. 5-24 to highlight.*
- a<sup>5</sup>. Page 5-25, Section 5.4. There is insufficient information for the designer/geotechnical engineer to determine infiltration rates for infiltration BMPs. See additional comments specifically on infiltration. Also, we feel that

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the Underground Injection Code (UIC) criteria for vadose zone treatment capabilities and pollution loadings should also be adapted to the manual's guidance for surface infiltration facilities.

*COMMENT NOTED: Additional guidance for selecting design infiltration rates can be added to section 5.4 following appropriate technical review. The UIC rule does not apply to surface infiltration facilities, and the interim guidance provided in this Manual will be finalized after the publication of this Manual and published separately.*

- b<sup>5</sup>. Page 5-27, Table 5.4.1. Gives short-term infiltration rates without any guidance on how to convert the rates to long-term infiltration rates. This should just be used as an estimate for preliminary work, not final design since each site is different. This is the only infiltration rate guidance in the manual. It is referred to in Chapter 6. The manual needs better guidance on design infiltration rates both for surface and subsurface.

*RESPONSE: The short term infiltration rates and correction factors in table 7.1 of the SWMMWW will be explained in the text referring to table 5.4.1.*

- c<sup>5</sup>. Page 5-27, Note 2. Why not suitable? Table 5.6.1 says 15 feet is adequate to protect groundwater except under high pollution loadings. Also see comments on specifically infiltration included separately.

*COMMENT NOTED: Table 5.6.1 is provided as interim guidance for UIC facilities while the rule and technical guidance are finalized. The debate as to whether these tables can/should be used where the pollutants include soluble pollutants (nitrates, lead, copper, organics, etc.) that can penetrate porous soils will be continued in the finalization of that guidance. That committee may also address whether this guidance can/should apply to surface infiltration facilities.*

- d<sup>5</sup>. Page 5-28 SSC-1, 2nd second bullet on page. Is the 50-foot minimum without an engineer's analysis? Should be consistent and use the setback greater than or equal to the height or per an engineer's analysis for all steep slope criteria. I imagine in some cases even this may be to close. Check local Critical Area Ordinances and use good professional judgment.

*RESPONSE: Will change the statements in this bullet to, "Setback distance greater than or equal to 50 feet or as determined by a professional engineer. Also check local Critical Area Ordinances."*

- e<sup>5</sup>. Page 5-28, 6-30. What is a "Native Growth Protection Easement"? It is not defined in the glossary. It is in the SWMMWW glossary, but even this definition is vague. *RESPONSE: Will add the SWMMWW definition to the glossary, "An easement granted for the protection of native vegetation within a sensitive area or its associated buffer. The NPGE shall be recorded on the appropriate documents of title and filed with the County records division."*

- f<sup>5</sup>. Page 5-28, SSC-3. Drywell criteria should be an option. Also, if the 2.5 times maximum design flooding depth is applied, the "Spokane County Bioswales" would have to use 1.25 feet of top soil where ½ of foot seems to be adequate. It is nearly impossible given current testing and analytical methods to determine infiltration rates on native material to the degree of precision necessary to establish a 2.4 inch/hour infiltration rate. If the soil texture has the physical and

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chemical properties as states in SS5, is this an option that can be used if the soil has a higher rate than 2.4 inch/hour?

*COMMENT NOTED: See comment c5 above. Additional topsoil is not required if the underlying matrix has sufficient infiltration capacity. The 2.4 in/hr is meant as a maximum level not to be construed as a significant figure. This is technical guidance to be used by the site design professional that makes the final judgment.*

- g<sup>5</sup>. Page 5-31, BMP T5.10, Design Criteria. See above comments on UIC criteria and infiltration rates.

*COMMENT NOTED.*

- h<sup>5</sup>. Page 5-31, BMP T5.20. Add a note on UIC registration if the trench contains a perforated pipe.

*RESPONSE: Will add the note. See also comment 11.4.*

- i<sup>5</sup>. Page 5-32 & 5-33, Table 5.4.2 and 5.4.3. Why limit the infiltration rate between 0.15 inch/hour and 0.40 inch/hour and 0.41 inch/hour and 1.0 inch/hour? What happens if the soil properties have a higher infiltration rate? Does this mean there is a special soil amendment that must be used when using this BMP to attain those infiltration rates?

*COMMENT NOTED: These tables are provided to simplify sizing and design of facilities under the noted conditions. Additional design work is required outside of this range of conditions.*

- j<sup>5</sup>. Page 5-33, BMP T5.30, Additional Design Criteria, bottom of page. If bottom slope is one percent, how is the volume calculated? Does one use the total volume or just the volume less than 6 inches at the deep end? Overflow could be to surface water, not only infiltration. Change “. . . infiltrative facility . . .” to “overflow facility”. *RESPONSE: The volume must be sufficient for the water quality volume to be treated prior to overflow or infiltration. Spokane County may clarify the volume calculation criterion. Will change to "infiltrative or overflow facility."*

- k<sup>5</sup>. Page 5-34, BMP T5.30, Additional Design Criteria, 3rd bullet. Remove 3rd bullet. It is redundant given bullet one at top of page.

*COMMENT NOTED: The intent is to focus on treatment soil that is adequate for the growth of vegetation.*

- l<sup>5</sup>. Page 5-34, BMP T5.30, Additional Design Criteria, 4th bullet. If the 2.5 times maximum design flooding depth is applied the “Spokane County Bioswales”, one would have to use 1.25 feet of top soil where ½ of foot seems to be adequate. UIC vadose zone treatment criteria should also apply.

*COMMENT NOTED: See comments c5 and f5.*

- m<sup>5</sup>. Page 5-36. Can other *n* values be used for site-specific grass values?

*RESPONSE: Will add qualifying statement as follows: "Other *n* values can be used for specific site vegetation as determined by the site professional and may be subject to approval by the project review authority." Also need to fix the equation on p. 5-37 to accommodate changes in Manning's *n* values.*

- n<sup>5</sup>. Page 5-37, BMP T5.40, Design Procedure, Step 4. How does *n* value go up for less densely planted bunch grass than for lawn grass? We realize lawn grass will lie down, but typical dry-land grasses will usually have a lower *n* value.



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Also, the equation has a predetermined  $n$  value of 0.2. It needs to be changed so that the  $n$  value can be adjusted depending on the type of grass used.

*RESPONSE: Thank you. This is in error and will be corrected. See also 21. f.*

- o<sup>5</sup>. Page 5-37, BMP T5.40, Design Procedure, Step 9. Change the design frequency for the check for damage and capacity to the 10-year event. This is the standard recurrence interval used for the design roadside ditches. This provides consistency. The manual should not specify length of design event just the recurrence interval.

*RESPONSE: will note that a 10-year design storm is acceptable and note that reparative maintenance will be required after every 10-year event. The velocity needs to stay below 2 ft/sec and the  $n$  value may be adjusted.*

- p<sup>5</sup>. Page 5-39, BMP T5.50 Design Criteria, 1st bullet. Increase maximum width of road to 40 feet to allow for use on typical road with two 12-foot lanes and eight-foot shoulders.

*COMMENT NOTED: The design procedure must be modified for a longer flowpath.*

- q<sup>5</sup>. Page 5-39, Design Procedure 2nd bullet. Increase allowable slope to 17 percent to allow standard 6:1 shoulder slope. This is a valuable BMP but will not be used if it cannot be built into standard roadway design practices.

*RESPONSE: Agree to change the longitudinal slope allowed to 6:1 or 17%.*

- r<sup>5</sup>. Page 5-41, Figure 5.5.2. This Figure allows at least 50-foot contributing flow path, which is different from the text. Should change “longitudinal slope” to “super rate” or “cross slope” use standard roadway engineering terms. Also max slope of the road should be increased to 5 percent and not called “lateral”. Increase filter strip long. Slope to maximum 17 percent.

*RESPONSE: Figure 5.5.2 will also be changed to 30' and cross section to 1%-17% slope and note a minimum filter strip length of 4' for a 10' flowpath; 4.5' for 20' flowpath; and 5.5' for 30' flowpath since Figure 5.5.1 data begins at 2% slope. The text will be changed to ensure consistency. Will state “longitudinal or cross slope.” No justification provided for increasing “lateral” slope to 5%; we believe that is too steep to allow the intended proper flow across the filter strip. The Narrow Area Filter Strip Design and the appropriate use of figure 5.5.1 are meant for flow paths of less than 30 feet; but Figure 5.5.2 notes that 18” flow spreader is required for each 30' of flow path. Identifying the appropriate filter strip length for the site slope for longer flowpaths may require additional analysis for practical application. The BMP may be limited to crowned roads where filter strips can be added along both sides and not to banked roads that all drain to one side. See also comment 24, 3<sup>rd</sup> bullet. Will also add hydraulic residence time from the SWMMWW as an alternate method for larger roadways. Will also remove the 1” drop from the figure.*

- a<sup>6</sup>. Page 5-59. Per Figure 5.2.1 on page 5-10, a “large wetpond” is only applicable to phosphorus removal, not “higher levels of pollutant removal”.

*COMMENT NOTED: The increased sedimentation efficiency and residence time should result in higher levels of removal of TSS, oil, metals as well as phosphorous.*

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- b<sup>6</sup>. Page 5-63, Table 5.7.1. What hydrology method and unit hyetograph was used? If another method is used is that still valid approach? Why is the 2-year precipitation shown if the runoff treatment is 90 percent or the 6-month volumes?

*COMMENT NOTED: The table is provided to allow conservative sizing of the BMP without requiring hydrologic analysis. The BMP can still be designed using the appropriate design storm and hydrologic analysis.*

- c<sup>6</sup>. Page 5-77, Wetland Geometry, Criteria #2. There is no volume calculated in Step #1.

*RESPONSE: The following explanatory note will be added: "There is currently no single accepted method for computing volume requirements for constructed wetlands. The procedure should probably be left up to local practice. Volume needs to include a slow draining portion as well as a permanent pool. The slow draining pool should release the runoff volume over a period of at least 5 days. No more than half the volume should be released within about 2.5 days.*

*"The general rule of thumb for the permanent pool is that it should provide a residence time of at least 14 days. It is not drained through an outlet but rather through ET and infiltration. However, this is inadequate for Eastern Washington due to the precipitation patterns during our summers and cold winters: a dry wetland with dead vegetation does not provide much protection to fall precipitation events, and near-frozen pond does not promote much biological uptake of nutrients in the early spring.*

*"See Koob et.al. (1999) for a statistical procedure for analyzing the time between precipitation events versus the risk of a dry pond. Local infiltration data and evapotranspiration data are essential to produce reliable estimates." The following reference will be added to the Manual: Koob, T., Barber, M.E. and Hathhorn, W.E. (1999) "Hydrologic Design Considerations of Constructed Wetlands for Stormwater Runoff," Journal of the American Water Resources Association, Vol. 35, No. 2, pp 323-331.*

- d<sup>6</sup>. Page 5-77, Wetland Geometry, Criteria #3. Four-foot minimum may be impractical in many areas in eastern Washington.

*COMMENT NOTED: At less than 4 ft the velocities will prevent adequate settling of sediment and result in sediment settling on the vegetation in the pond and negatively impacting the performance. Furthermore, maintenance costs will become prohibitive due to the need for frequent dredging.*

- e<sup>6</sup>. Page 5-77, Wetland Geometry, Criteria #4. 1.5 feet may be impractical in eastern Washington. Design criteria should mimic the native wetlands in the area, not a canned copy of western Washington BMPs. Many of the wetlands in eastern Washington are seasonal or ephemeral. Are the listed plants native to eastern Washington in Table 5.7.2? Why is a source from western Oregon listed?

*COMMENT NOTED: While we agree that the average of 1.5 feet +/- 3 inches may or may not be appropriate for all parts of Eastern Washington, in the absence of local research into optimum water depths 1.5 ft does provide an approximate target that is appropriate for the plant species listed in Table 5.7.2. Climate conditions in Western Oregon are similar to some parts of Eastern*

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*Washington. Ideally, we would have a list of vegetation for each ecoregion in the State. However, this information is not currently available. The function of stormwater wetlands is not the same as natural wetlands so not all characteristics of natural wetlands will be transferable to stormwater wetlands.*

- f<sup>6</sup>. Page 5-99, Evaporation Ponds. There is no design guidance in Section 5.4 for evaporation just infiltration ponds?

*RESPONSE: Will change reference to Section 6.4.*

- g<sup>6</sup>. Page 5-102, Figure 5-10. This figure should be referenced the first time it is mentioned in the manual. This comment goes to many other parts of the manual as well. It needs to be edited so that one can find things when they are mentioned.

*RESPONSE: Will reference this figure where a Spill Control (SC) oil and water separator is mentioned in the other parts of this manual.*

- h<sup>6</sup>. Pg 5-111, Section 5.11.2 Infiltration Treatment. Where is a pre-settling basin detailed and how is it designed? Also, the rest of the process does not make sense and should be reworded for clarity. Specifically: Infiltration Treatment, infiltration is a basic treatment. Therefore one could have two infiltration facilities in a row. Seems like a waste of space if one will work. Second process is the same as the first. In reference to fish bearing streams the same criteria as stated in the UIC guidelines should be used. A shallow water table less than 10 feet and within 100 feet of the water body that is impaired due to metals, not all fish bearing streams. Also, there should be a list of exempt streams similar to western Washington.

*COMMENT NOTED: The pre-settling basin should be detailed with the infiltration BMP design criteria. The intent of infiltration treatment is to be applied as a stand-alone treatment with appropriate pre-treatment to protect the facility from clogging by debris and oils. What is detailed here are the conditions for the BMP's use as a metals treatment BMP, which in some cases will be as part of a treatment train. Agree that stream setbacks should be consistent; however this section was written with the intent of protecting surface water and since the UIC (groundwater) guidance is not finalized, it is not appropriate to use the UIC setbacks as the standard for the rest of the Manual. In any case, the criteria should apply to all non-exempt fish-bearing streams and lakes.*

- i<sup>6</sup>. Pages 5A-11 & 12, Maintenance of Bioswales and Filter Strips. Mowing is not an option with native dryland erosion control grasses.

*COMMENT NOTED: The need for mowing has sufficient qualifier language.*

- s<sup>7</sup> Section 5.4.4, Best Management Practices (BMP's) for Infiltration and Bio-Infiltration Treatment, BMP T5.10 Infiltration ponds, Design Criteria, p. 5-31: It states that "Design of infiltration ponds for water quality treatment is identical to the criteria given in Section 6.3.6 (BMP F6.21, p. 6-38), except that the allowable infiltration rate is limited to 2.4 in/hr or less." There is nothing in Section 6.3.6 that provides guidance on the determination of design infiltration rates for flow control facilities. Instead, Section 6.3.6 refers to Table 5.4.1 for design infiltration rates. It appears that infiltration rate guidance is missing in Section 6.3.6. See comment #r<sup>7</sup> above. This comment also applies to BMP

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T5.20 for infiltration trenches.

*RESPONSE: Agree to add reference to Appendix 6B; see comment 18.mmm in responses to comments on Chapter 6.*

- u<sup>7</sup> Table 5.4.1, p. 5-27: Notes provided below the table indicate the presumptive values provided in the table are from the Western Washington Ecology manual, and that they represent short term rates. No guidance is provided in the Eastern Washington manual regarding how to use these presumptive values. Does one apply the correction factors provided in the Western Washington manual to convert these short-term rates to long-term rates, or is it intended to use the short-term rates directly? If the latter is the case, why does the manual ignore the potential for siltation or biofouling to reduce short-term rates in the long-term? What is the justification for this inconsistency with the Western Washington manual?

*RESPONSE: Agree to add the correction factors to convert to long-term rates with information about where they come from and what the limits might be for applying them to sites in eastern Washington, such as the depth to the water table. Will also note that a very general rule is to measure the rate and divide by 2 (site conditions will affect this).*

**18. Spokane County (August 25)**

- ee. Section 5.2.1, Figure 5.2.1, BMP Selection Process, Page 5-10: Add “Natural Dispersion” to flow chart.  
*COMMENT NOTED: See comments 4.t, 16.k4, m4, and p4. Dispersion may be used as a combined flow control and treatment BMP but it is meant primarily for runoff control.*
- ff. Section 5.2.1, Figure 5.2.2, BMP Selection Process for Discharges, Page 5-11: “Apply Treatment BMP” Box: This box lists some of the BMPs allowed but not all. For consistency, it seems that either all or none of the BMPs should be listed here. *RESPONSE: Will not list BMPs here.*
- gg. Section 5.2.2, Other Treatment Facility Selection Factors, Table 5.2.4, Page 5-15: Under the Infiltration row for Semi-Arid Watersheds, it refers to Table 5.6.4. This table does not appear to be in the manual. Also, why are biofiltration swales not recommended or have limited use? Could they use dryland grass?  
*RESPONSE: Will change reference to Table 5.6.3. See also 16.v4.*
- hh. Section 5.2.3, Cold Weather Considerations, Page 5-17, second paragraph refers to an internet address that cannot be found. This section describes the design challenges for the BMP and their applicability in Cold Regions. However, no recommendations are provided to modify these BMPs so that they can perform better during the colder seasons. In addition, those BMPs, such as the basic and large sand filter, that are determined to be ineffective in Cold Climates should not be included in the manual as all of Eastern Washington is susceptible to (and regularly experiences) cold weather.  
*RESPONSE: Will check the url and make the correction. Will leave it to local jurisdictions to identify BMPs that are not allowable in their areas.*
- ii. Section 5.4.3, General Considerations for Infiltration and Bio-infiltration Facilities:

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- Table 5.4.1, Page 5-27: Are these surface infiltration rates for treatment only? These rates appear to be low. In Spokane County, a project does not typically get credit for infiltration if the infiltration rate is less than 10 in/hr and a standard infiltration facility (i.e. a drywell) requires a minimum of 72 in/hr to be considered at the standard outflow rates (which utilize a SF of 2).  
*COMMENT NOTED: These are infiltration rates for treatment only and are consistent with the bio-infiltration design criteria.*
  - SSC-3 Soil Infiltration Rate/Drawdown Time, Page 5-28: In the previous draft report, this section indicated that the facility was to be designed to completely drain all ponded runoff within 72-hrs after flow to it has stopped. The new draft manual indicates the long-term soil infiltration rate should be 2.4 in/hr. How was this new design criteria was determined?  
*RESPONSE: The drawdown time will be changed to 72 hours. The 2.4 in/hr is meant as a maximum level not to be construed as a significant figure. This is technical guidance to be used by the site design professional that makes the final judgment.*
  - Verification of Performance, Page 5-31: Text states that verification testing as specified in SSC-7 is strongly recommended. SSC-7 does not mention testing; it only recommends visual monitoring of the facilities.  
*RESPONSE: SSC-7 refers to quarterly visual monitoring over a 2-year period to assess the performance of the infiltration facility. Will change p. 5-31 mention of “verification testing” to “verification monitoring.”*
- jj. Section 5.4.4, BMP T5.30 Bio-infiltration Swale, Alternative Design Method, Page 5-33: It was agreed in the last Manual Subcommittee Meeting that Spokane County’s Method for water quality treatment was going to be referred to in one of the methods in this chapter. It appears as if the Alternative Method is an attempt to mimic our method. The Alternate Design method is not consistent with our methodology. Please make the following modifications to this method:  $A_I$  is the impervious area (PGIS) that is hydraulically directly connected to the treatment facility; and the following language best describes the method:
- “This method matches Spokane County’s methodology by using the first one-half inch of runoff from pollution-generating impervious surfaces that are hydraulically connected to the treatment facility to size the bio-infiltration swale. This method does not require treatment of any permeable surfaces such as lawn or landscaped areas, and does not give credit for infiltration through the bottom of the swale. The treatment depth is typically 6 inches. A maximum treatment depth of 8 inches is allowed if cation exchange capacity testing indicates that the CEC is 15 meq/100 g or greater. CEC testing can be completed post-construction or a soil amendment that meets the CEC requirements can be specified on the construction drawings. The swale is sized to store the required design storm runoff volume generated by the contributing basin by using the entire swale depth, typically no deeper than 1 ft, in conjunction with a subsurface infiltration facility, such as a drywell.”  
*RESPONSE: Will make the changes with the following edit: change “The*

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swale is sized to store the required design storm runoff volume generated by the contributing basin by using the entire swale depth...” to “The swale is sized to store the required runoff volume (using the design storm established by the local jurisdiction; the 25-year Type 1A storm is the default design storm) generated by the contributing basin by using the entire swale depth.

- eee. Section 5.7.3, Design Criteria, Table 5.7.1, Page 5-63: Can you clarify that the size of the wetpond required per this table is for water quality treatment only? Additional area may be required if the wetpond is used for volume control.

*RESPONSE: Will change the table heading to: "Wetpond Sizing Table for Basic Treatment Design".*

- fff. Section 5.7.7, BMP T5.73 Stormwater Treatment Wetland:

- Wetland Geometry Criteria, Step 5, Page 5-77: The average depth is 1.5 feet ( $\pm$  3 inches). In Sizing Procedure, Step 2, Page 5-80, the average depth is said to be 3 feet typically. This seems to be in conflict.

*RESPONSE: Agree that the criteria should be clarified: the average depth required for the total storage volume is typically 3 feet and the average depth required for the permanent pool is typically 1.5 feet.*

- Table 5.7.2, Page 5-81: Are all of the species listed in this table good for cold weather climates?

*RESPONSE: Will try to check these species with NRCS; see also comment 16.e<sup>6</sup>.*

- ggg. Section 5.9, Evaporation Ponds, Page 5-99: This section refers to Section 5.4 for details on evaporation pond. It should be 6.4.

*RESPONSE: Thank you for the correction. Will change to Section 6.4.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- f. UIC Facilities – 5.4.4 – Best Management Practices (BMP) for Infiltration and Bio-infiltration Treatment. In T-5.10 and T5.20, they set a maximum infiltration rate of 4.2 inches per hour. Based on discussions with those preparing this Manual, this infiltration limit does not apply to an infiltration pond or infiltration trench that is not being used for treatment of stormwater.

Comment: We support this position

*COMMENT NOTED.*

**21. Gary Minton (September 17-22, 2003 - late comments)**

- a. On page 5-28 it is stated that drawdown is to occur within 24 hours but on Page 5-30 it is said to use 72 hours. Please clarify.

*RESPONSE: Should say 72 hours on p. 5-28.*

- b. Extended detention identified in Table 5-2-4 p.5-15 as a preferred BMP, but is not presented as any of the BMPs in the following sections. Only wet ponds are discussed. Why is there no presentation on design of extended detention basins?

*COMMENT NOTED: BMP T5.71 “Large Wetpond” beginning on p. 5-59 provides the design specifications.*

- c. I also did not find any minimum infiltration rate for soils The W. Wash version has 0.5"/hour.

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*RESPONSE: Agree that a minimum infiltration rate of 0.5 in/hr is appropriate to include for SSC-3 on p. 5-28. Will also include note to check for local requirements.*

- d. Table 5.6.4 is referred to in Table 5.2.4 but does not appear in the text. Is it supposed to be Table 5.6.3?

*RESPONSE: Will change to 5.6.3.*

- e. In Table 5.2.6 reference is made to the use of extended detention in an semi-arid area, and on the left side of the column it is identified as T6.71. There is no T6.71. Is this an error, and what is meant is T 5.71? My impression is that this table was not corrected when the two chapters were switched. Regardless, there is no discussion in T5.71 that describes extended detention and how to size it, etc. It is discussed on Page 5.63. I infer that an extended detention pond would have the same size as a wet pond, but this is not stated explicitly. More importantly, there is no specification on the drawdown time at brimfull. Was this an oversight? Is it the intention of the manual to allow the use of extended detention as a "stand-alone" system, unlike the west side?

*COMMENT NOTED: The correct reference is to T5.71. Extended detention is a large wetpond, rather than a basic wetpond. The drawdown time is 72 hours.*

- f. Page 5-36, Comment on the following verbiage "Manning's roughness coefficient (use  $n = 0.20$  for typical biofilter with turf/lawn vegetation, and  $n = 0.30$  for biofilter with less dense vegetation such as meadow or pasture.) You have this wrong. The resistance coefficient goes down not up when the grass gets thinner. If you are happy with 0.20 for normal turf grass then you should have a lower value for  $n$  for "meadow or pasture".

*RESPONSE: This will be corrected. See also  $16.m^5$  and  $16.n^5$ .*

- g. Page 5-63, Table 5.7.1 where would Spokane fall in this list. The rainfall map is unreadable and I am unable to determine the 2-year depth for Spokane on that map. Also, the volume specified is  $\text{ft}^3/1000 \text{ ft}$  of impervious surface. Does that mean that the pervious area is not included in the calculations?

*COMMENT NOTED: The readability of the isopluvial maps needs to be addressed before publication of the final draft Manual (see comment 23). The table was developed by Mel Schaeffer early in developing the first draft of the Manual, at that time the subcommittee was focused only on treating flows from PGIS. Although in the core elements they are still clearly required to size BMPs for all flow directed toward them, this shortcut was intended for commercial development projects that will have very little pervious surface. Spokane has their own standard design criteria.*

- h. Wetland... no mention is made of a desired length/width ratio. Is this intentional or overlooked?

*RESPONSE: A minimum 2:1 length/width ratio is typically specified and will be added as a recommendation. The shape is generally dictated by the surrounding site geometry, but the reason for the ratio is to prevent short circuiting across the pond. Baffles, islands, and creative inlet structures can be used promote adequate mixing in challenging settings.*

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- i. Page 5.80 Under Step 5, I think you want to say Criterion 8 "Wetland Geometry (above)  
*COMMENT NOTED: Criterion 8 is on p. 5-77.*
  - j. Some observations on Table 5.11.1 and 5.11.2
    - Is it prudent put a grass swale or strip in front of a sand filter, given the susceptibility of erosion in the swale/strip? Perhaps this concept should be limited to swales/strips that are irrigated, i.e. assurance of thick grass. However, the thicker the grass, the less likely you will get removal of dissolved metals as you need the stormwater to contact the soil. So there is no benefit unless you have infiltration  
*COMMENT NOTED.*
    - is it prudent to put wet ponds in front of a sand filter, given the tendency of alga growth in the pond. Algae leaving the pond can clog the filter. You might want to look into the experience of using horizontal rock filters in wastewater lagoons.  
*RESPONSE: Will add note that a horizontal rock filter may reduce transfer of algae from the pond to the filter.*
    - Elsewhere in the country, only wet vaults or extended detention ponds have been used ahead of filters. Want not use extended detention, giving the arid conditions.  
With the exception of sand filters following extended detention, there are no data that demonstrate that putting two full size "boxes" in series does anything with respect to either dissolved metals or improved phosphorus removal.  
*COMMENT NOTED.*
    - The Department of Ecology's inclusion of Tables 5.11.2 comes from the King County manual. However, King County had a different basis for including these tables, not apparently recognized by Ecology. First, the King County goal was for the removal of total metals, not dissolved. This means there are combinations in the two tables that may not provide any consistent removal of dissolved metal, but which meets the King County goal (but not necessarily the Ecology goal of "improved dissolved metal removal"). Secondly, the fundamental reason for King County using a two box system was not necessarily to increase removal of metals per se, but to increase the reliability of treatment for very sensitive water bodies. Ergo, King County does not require that the metals criterion be met for all "fish bearing" streams but for "streams of regional significance". The final reason for King County restricted the concept to unique situations was because there was not then (1995) nor is there yet any data to indicate that adding a second box will provide any significant improvement in treatment, with the exception noted above. I can make these statements with confidence because i am the one who developed the concept for King County. Ecology has taken the King County concept and broadened to all fish-bearing water bodies.  
*COMMENT NOTED.*
22. Additional comment from 9/11 meeting: on p. 5-20, 21 change all of the 6's to 5's.  
*RESPONSE: Will change.*



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- 23.** Additional comment from 9/11 meeting: The isopluvial maps still need correction. Consultant team lead states that budget did not allow for corrections to be made; subcommittee countered that errors introduced by the consultant team should be fixed.

*RESPONSE: If the consultant team is unable to correct errors, Ecology will ask its GIS staff to make needed revisions to the maps. Ecology requests that interested parties who have commented on the failings of the current maps be available to staff working on the maps. The final maps will be made available on Ecology's website and included in the CD version of the Manual; the printed Manuals will include 11"x17" color printed versions.*

- 24.** Additional comment from 9/11 meeting: The consultant team lead had a list of other first round public comments/items that still needed to be addressed or provided by others for the final draft Manual. Here is the status of the items that apply to Chapter 5:

- 33 Spokane Co. #32 – Check into step 9 of BMP T5.40 (p. 5-37 in final draft) on “shear stress or velocity” should be checked during design process.

*STATUS: See comment 16.o<sup>5</sup>.*

- 40 WSDOT #6-62 – Consider King Co. method of treating 95% of annual runoff volume using a large Sand Filter.

*STATUS: BMP T5.81 on p. 5-84 of the final draft states a performance objective of removing 50% of total phosphorus by treating 95% of the runoff volume. No further comments received on this BMP.*

- 33 Spokane Co. #31 and 40 WSDOT #18 – Check into BMP T5.50 Vegetative Filter Strips and the maximum flow path distance; figures 5.5.1 & 5.5.2 (pp. 5-38 to 5-41 in final draft).

*STATUS: In discussing the first round comments on this BMP on the first draft of the Manual, the committee agreed to make two changes to figure 5.5.2: Change 50' to 30' in the plan view and note that the 1" drop in the section view is not safe. Neither of these changes were made to the figure in the final draft Manual, but they will be made for the final Manual. See response to 16.r<sup>5</sup>.*

- 30 Yakima #6 – Consider adding detail showing a shut-off valve upstream of an infiltration trench (BMPs T5.20, p. 5-31 and F6.22, p. 6-40).

*STATUS: Suggested detail was not added to final draft Manual and no further comments were made. No change made.*

- Insert a section on Dry Ponds in Chapter 5.

*STATUS: This was not included in the final draft Manual. See suggested response and proposed changes below (also per comments 9.j and l): Extended detention dry ponds are referenced throughout section 5.7.1. We propose that the following subsection be added beginning at the top of p. 5-67 before planting requirements; the full references would be included in the Bibliography. The last row of Table 5.2.6 on p. 5-22 would be moved back between Large ED Wetpond and Wetvault on the previous page, with only a reference to section 5.7.1 and no BMP#. The section below is still lacking design criteria and proposed designs will need evaluation prior to approval. Need to add a section after the intent section listing problems and possible solutions, e.g. bypass for large events.*

### **Extended Detention Dry Ponds**

**Design Features and Considerations:** Dry ponds are structures that completely drain between runoff events. A perforated riser or outlet control device enables water to slowly drain from the pond. Initial attempts at stormwater management involved ponds that were designed primarily for hydraulic control. Consequently, dry ponds are some of the most widely used facilities in urban stormwater infrastructure. With the emergence of water quality issues, the desire to designate these facilities as dual-purpose detention facilities is considerable. However, standard dry ponds are generally not very effective at treating water quality. One difference is that flood damage occurs as the result runoff from events having return periods greater than two years whereas environmental damage may be caused by the cumulative effects of numerous small storms. For basins with detention times less than 12 hours, no more than 10 percent of the pollutants are captured (ASCE, 1992). Some studies have even produced negative results because of potential flushing of pollutants captured in previous small events (Pope and Hess, 1989).

**Intent:** As a way to improve water quality performance, designers have suggested that dry ponds be designed to retain stormwater for at least 24 hours. Ponds with detention times greater than 24 hours are referred to as Extended Detention dry ponds. Schueler and Helfrich (1989) recommended that sufficient volume should exist to hold the runoff generated by 0.5 inches of effective rainfall. Because pollutant removal is by adsorption and settling, cold weather considerations regarding the changes in viscosity, and subsequently the settling velocity of particles, should be factored into the final design.

ASCE (1992) "Design and Construction of Urban Stormwater Management Systems," ASCE Manuals and Reports of Engineering Practice No. 77, ASCE, New York, NY.

Pope, L.M. and Hess, L.G. (1989) "Load-Detention Efficiencies in a Dry-Pond Basin," in Design of Urban Runoff Quality Controls, edited by Roesner, Urbonas and Sonnen, ASCE, New York, NY.

Schueler, T.R. and Helfrich, M. (1989) "Design of Extended Detention Wet Pond Systems," in Design of Urban Runoff Quality Controls, edited by Roesner, Urbonas and Sonnen, ASCE, New York, NY.

### **Chapter 5.6**

*(note that some comments apply to sections in Chapters 1 or 2)*

**Note:** The provisional guidance in Chapter 5.6 of the Final Draft Stormwater Management Manual for Eastern Washington was developed by Ecology staff with input and assistance from the UIC Rule Revision Advisory Committee, which is comprised of stakeholders and interested parties from across the State. The process of developing and finalizing this guidance will continue as a parallel process to completing the revisions to the rule. Until the rule is finalized, the chapter will be included in the eastern Washington Manual with only minor modifications/corrections made so that interim guidance is available to local jurisdictions and project proponents until the rule and associated final technical guidance is published. The chapter in the final eastern

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Washington Manual will be published with the following language inserted at the beginning of the chapter: *“This section provides provisional interim guidance for projects disposing of stormwater using facilities regulated under the Underground Injection Control (UIC) program. At publication, final technical guidance was under development in a statewide process parallel to the revision of Washington’s state UIC rule. When the rule is completed and the final technical guidance published, this section will be superseded all or in part by that guidance. See Ecology’s website at [www.ecy.wa.gov/programs/wq/grndwtr/uic](http://www.ecy.wa.gov/programs/wq/grndwtr/uic) for information and updates on the UIC rule revision.”* This entire document will be forwarded to the UIC rule revision interested parties list.

The following comments (**highlighted in yellow** in the body of the document) may result in changes to the interim guidance to be published in the final Stormwater Management Manual for Eastern Washington:

3.a; 3.b; 3.d.iii; 4.f; 7.e; 7.h; 7.k; 10.ee; 11.z; 11.aa; 16.s<sup>5</sup>; 16.t<sup>5</sup>; 16.u<sup>5</sup>; 16.v<sup>5</sup>; 16.x<sup>5</sup>; 16.y<sup>5</sup>; 18.bbb; 18.ccc; and 18.ddd.

The following comments (**highlighted in blue** in the body of the document) will be considered in making further changes to the draft UIC rule language and the final technical guidance document:

3.c; 3.d.iv; 7.c; 7.d; 7.f; 7.g; 7.i; 7.j; 7.k; 10.k; 10.w; 10.y; 10.z; 10.aa; 10.cc; 10.ee; 15.e; 16.w<sup>5</sup>; 16.z<sup>5</sup>; and 18.ccc.

All of these suggested responses to comments are provisional, and Ecology is not committing to specific rule language at this point.

## **2. Public workshops (June 23-26)**

- c. Need to make the Stormwater Manual for E WA consistent with other state requirements, particularly with reference to UIC components:

*COMMENT NOTED: Our intent is to be consistent. Thank you for pointing out some specific examples for our consideration.*

- i. Manual proposed rule authorizing injection of untreated stormwater as little as 6’ above an underground source of drinking water.

*COMMENT NOTED: This is true only for land uses with low pollutant loadings and very good knowledge of on-site geology.*

- ii. On-site wastewater disposal via drain fields requires separate permits and inspection prior to installation.

*COMMENT NOTED: Although we agree that it is a good idea for facilities for sites with moderate and especially high pollutant loadings to be inspected prior to use, Ecology does not have the resources, nor does it believe it is an environmental priority to require separate permits and inspection of most stormwater disposal facilities.*

- iii. Aquifer recharge by infiltration or injection of reclaimed water requires treatment to drinking water standards.

*COMMENT NOTED: Stormwater is not allowed to be directly injected into a drinking water supply aquifer, so evaluation of treatment provided by*

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*the geologic matrix prior to the stormwater reaching the aquifer is still appropriate.*

- h. Hopefully we will be able to liberally use this UIC method in the future.

*COMMENT NOTED: Thank you. As noted above, the method is still under development. We advise you to keep track of that process.*

**3. City of Olympia (July 16)**

Ecology has stated this chapter (5.6) will be used on the Westside. I think it would be troublesome as currently proposed. Here are my comments:

*COMMENT NOTED: As noted at the beginning of this document, this guidance will continue to be developed and finalized in a statewide process. Your comments here will be considered as part of that process.*

- a. On p. 5-42, the UIC definition seems imprecise. It could be read as stating that any dug hole, such as a trench or vault, that is not deeper than its largest surface dimension, is not a UIC. Most infiltration systems used in western Washington are not deeper than their largest surface dimension (typical depth, 10 feet or less; typical width, tens to hundreds of feet). Therefore, it could be concluded that these are not UICs. Please clarify.

*RESPONSE: This language is consistent with the federal definition of a UIC well. If a trench has perforated pipe in it or going into it automatically is a UIC well. To assist in clarification (as suggested in comment 11.aa) we plan to identify each BMP that falls under the definition of a UIC facility as such in Chapters 5 and 6 of the final Manual.*

- b. On p. 5-48, it is impracticable to require that infiltration systems not discharge to groundwater at any time, unless seasonal/temporary/minor perched lenses in till or layered soils, temporary groundwater mounds beneath infiltration facilities, and unusual (well above normal) wet-season high groundwater levels are not included in the groundwater events, and do not result in groundwater quantities that would constitute an aquifer.

*RESPONSE: Will include a statement specifying that perched lenses are excepted. Otherwise, direct discharge to groundwater is not allowed unless the discharge meets groundwater standards.*

- c. On p. 5-48, pegging the separation to the “highest known groundwater levels” would mean infiltration could not be used on many otherwise suitable sites. Seasonal high groundwater elevations may vary by tens of feet between dry and wet years. Sites that infiltrate well in most circumstances are challenged in very wet years. It would be unreasonable and detrimental to surface water resources (because the stormwater would be discharged into a surface water) to categorically disallow infiltration in areas subject to occasional high groundwater levels.

*RESPONSE: Your comment will be addressed in finalizing the UIC technical guidance. Keep in mind that this guidance applies to new, not existing wells. Most sites will not have sufficient information to accurately determine seasonal high groundwater levels. Also remember that direct discharge to groundwater is not allowed unless the discharge meets groundwater quality standards. In areas that are known to be subject to high groundwater levels during wet years, perhaps another BMP such as surface infiltration would better suit the site.*

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- d. In Table 5.6.1 (p. 5-56), most western Washington soils will classify as having “high” or “medium” treatment capacity. This being the case, I recommend that Table 6.6.1 be revised as follows:
- i. Groundwater separation is defined as being from the normal long-term seasonal high groundwater elevation rather than the highest known level.  
*COMMENT NOTED: See 3.c above.*
  - ii. Infiltration is allowed into these soils, with no or minimal (three feet) groundwater separation, provided that the stormwater receives enhanced treatment prior to discharge. Enhanced treatment removes significantly more metals and hydrocarbons, including dissolved pollutants, than does basic treatment.  
*COMMENT NOTED: This is not allowed due to the long-term pollutant loading from the site and lack of ability to inspect and maintain the geologic matrix.*
  - iii. If enhanced treatment is used, any allowed land use (Table 5.6.3, less those prohibited land uses in Section 5.6.5) may discharge subject to no or minimal separation distances set in the above bullet.  
*RESPONSE: This seems like a reasonable condition, as groundwater quality standards are most likely to be met by applying enhanced treatment prior to discharge. Agree to include provision in final Manual.*
  - iv. In the current table, if the specified groundwater separation is available, then the indicated treatment approaches are acceptable. However, I don’t think they satisfy the current western Washington manual requirement to provide basic treatment prior to discharging to the ground.  
*RESPONSE: Agree that the SWMMWW requirement to provide basic treatment is not met with this table, which was developed as a new approach to identify appropriate conditions for infiltration without pre-treatment. When the rule and guidance are finalized, they may supercede the SWMMWW requirement.*

**4. Department of Ecology (July 30)**

- f. Consider establishing section 5.6 as a design guide for E WA UIC wells where no local requirements have been established. Most of the chapter would become a separate technical guidance publication that accompanies the revised UIC rule. This would allow for broader, targeted public review of the guidance.  
*RESPONSE: The subcommittee agreed to this approach in its meeting on September 11, 2003. See the note at the beginning of this document for proposed language to be published in the final Manual.*

**6. Pierce County (August 18)**

Thank you for the opportunity to comment on the Eastern Washington Stormwater Manual. I would like to commend you and the Steering Committee for your efforts in putting together a workable document that will go a long way toward preserving water quality in Eastern Washington. I would also like to commend the Model Program Subcommittee for putting together good interpretations of what the Phase 2 program really entails. I found the explanations to be much more helpful than the federal guidance we used for preparing our Phase 1 program. As a Phase 1 NPDES stormwater permittee in Western Washington, Pierce County does not wish to make

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extensive comments on the Eastern Washington Manual. We recognize the differences in climate, soils and hydrologic regime, and trust that the standing committees and Ecology have worked out most of the best options for stormwater control needed for the eastern part of the state. The comments we do offer are aimed at the applicability of the Manual with respect to compliance with Phase II Municipal Stormwater NPDES permits.

- a. The Manual goes to great lengths emphasizing that it has no stand alone, unique regulatory status and that equivalent approaches may be acceptable. However, Ecology ultimately will determine if Phase II communities in Eastern Washington comply with federal requirements for controlling stormwater to the federal standards of Maximum Extent Practicable (MEP) and state standards for all known, available and reasonable treatment and prevention (AKART). Given this, we note that on page 1-12, second to the last paragraph, the Manual requires local government to apply the Manual to its own projects. Elsewhere, (e.g., page 1-13, second paragraph), suggests the Manual's applicability is discretionary for private projects. Our question is: what is Ecology's intent in applying the Manual to Phase II communities: is it that only public projects be required to comply with the Manual?

*COMMENT NOTED: The federal NPDES Phase II municipal stormwater permit requirements – not the Manual – require local governments to apply the manual to their projects and to projects they regulates under their permitting authority. The requirement is merely referenced here. The intent is that prudent stormwater management practices be applied to all projects where protection of water quality is deemed to be an issue.*

- c. The other comment relates to the Underground Injection Control portion of the Manual. As you know, Pierce County has been participating on the committee updating the UIC regulations. Having been close to that process, and then hearing your presentation at the APWA Stormwater Managers Committee meeting, it did make me step back and wonder if we are requiring more evaluation to be done prior to the installation of shallow UICs than we are to the installation of septic systems of similar depth. I think this will be something to keep in mind as we work through the public process on the final UIC rule and perhaps adjust it for Western Washington.

*COMMENT NOTED: The goal of this process is to identify prudent practices for UIC facilities used to manage stormwater. Guidance for septic systems may be reevaluated in another process. Another consideration is that stormwater discharges are of a potentially greater total volume and may carry more toxic pollutants than discharges from properly designed, installed, and operated septic systems in a given aquifer system.*

**7. Stan Miller (August 18)**

I believe the overall document represents a useable tool for managing stormwater in Eastern Washington. In fact I believe with a little work the Eastern Washington and Western Washington Manuals could be merged into one document. While there are a few elements that call out different approaches, there is enough redundancy that the ultimate goal of Ecology should be to create a single document with separate chapters or sections to address the differences; the overall goals, water quality

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criteria, flood prevention and water quality treatment / best management practices should be uniform statewide.

The comments below focus on Chapter 5 of the rule. From the standpoint of my responsibility as “Aquifer Protection” Program Manager for Spokane County and my area of technical expertise, this chapter is of greatest interest. During the last 25 + years at Spokane County I have worked on stormwater quality issues as one of my main areas of research. This focus evolved out of my participation in the identification of major contaminant sources responsible for the observed degradation of Spokane Valley Aquifer quality. Major stormwater research activities include extensive runoff quality sampling in 1979 – 80 to establish a runoff quality data base for Spokane, managing an extensive evaluation of runoff quality and treatment by bioinfiltration swales – funded by Ecology and completed in 1983, an evaluation of alternative treatment covers in bioinfiltration swales – again funded by Ecology and completed in 1987.

*COMMENT NOTED: Thank you.*

- a. General Comment on Chapter 5: Overall I am very pleased with the product Ecology created from the deliberations of the TAC for this section. With the few exceptions noted below I believe the manual presents a good middle ground on the issues of injection; it seem the criteria used here, though they may result in degradation of ground water by conservative constituents like chloride and nitrate, the beneficial uses of ground water are protected. I am specifically appreciative of the approach used to address the proximity of ground water to impaired surface water and shorelines issues

*COMMENT NOTED: Thank you.*

- b. General Comment on Chapter 5: A key feature of the E WA manual is the provision for direct injection of stormwater using shallow injection wells locally called drywells. Concurrent with the development of the E. WA manual, Ecology has been amending WAC 173-218, the state’s UIC regs., making the practice of SRO injection practical by rule authorizing injection in prescribed conditions. The assumption of the developing rule is that under the conditions prescribed in the rule underground sources of drinking water will be protected from contamination. Tables 5.6.1 – 5.6.3 of the manual, summarizes the conditions assumed to be protective. I believe the conditions described in the tables, may be protective of groundwater in many cases in Eastern Washington but by no means describe conditions with a low enough risk of groundwater contamination to form the basis of a statewide rule. Care must be taken to insure that the E. WA Stormwater manual not drive the UIC regulations for the state.

*COMMENT NOTED: As noted at the beginning of this document, the processes of both revising the UIC rule and finalizing the associated technical guidance will continue after the publication of the final Manual. We encourage you to stay involved in those processes.*

- c. General Comment on Chapter 5: The Manual mentions removal of solids as the level of pretreatment required prior to using injection in several places. I believe the presumption that solids removal is adequate to achieve non-endangerment is premature. I have attached a literature review that documents



several cases where 1) a significant fraction of the toxics in runoff were dissolved, and 2) the dissolved fraction exceeded water quality criteria. There is also evidence coming out of groundwater studies showing that some of the “mobile” fraction of toxics formerly thought to be “dissolved” are actually bound to colloidal particles. Even though these move easily through groundwater media they would likely be filtered out and included in the “solids” fraction using standard analytical procedures.

*RESPONSE: Thank you for your extensive literature review. It will be helpful in the process of continuing work on the UIC rule and technical guidance. In the interim, we will continue under the assumption that for most pollutants and in most cases, removal of solids (as is provided by basic treatment or might continue to be reasonably achieved over the long term by the geologic matrix) is appropriate for most land uses, and additional treatment is required in noted circumstances. See also comment 10.y.*

- d. General Comment on Chapter 5: Several sections in the Manual mention “local government” or “local control” as the agents for judging the suitability of the geology for “Presumptive Use” of injection or for allowing exceptions to the rule. Ecology needs to take an active role in assuring local conditions and criteria actually meet non-endangerment. This could be through some form of appeal process that could be initiated by local citizens objecting to local rules they do not feel meet non-endangerment.

*RESPONSE: Ecology will consider this in writing the final rule language.*

- e. Table 5.6.1 and related narrative: In spite of the objections of many TAC members, I believe that there needs to be a note in the box for “High” treatment capacity that these materials generally have a low infiltration rate and injection wells installed in the material may fail to drain runoff from roadways in acceptable time periods.

*RESPONSE: A note to this effect can reasonably be added without changing the intended use of the table. Clarify that the matrix below the facility is being identified, not the layer in which the facility is constructed.*

- f. We cannot ignore the bacterial contamination problem in stormwater because it is ubiquitous and there is no effective way of removing bacteria. Injection of stormwater from surfaces known to have high bacterial counts should be prohibited unless the vadose zone in which the injection occurs can effectively remove enough of the bacteria to achieve non-endangerment. I believe that using treatment thickness on the order of a few 10’s of feet for all but low and no treatment media will provide acceptable results.

*RESPONSE: Agree that bacteria are a ubiquitous and difficult stormwater problem, but for the time being we believe that the greater environmental benefit is to be achieved through maintenance of the pre-project hydrologic cycle to the greatest extent possible – meaning infiltration of stormwater runoff despite these difficulties. In contrast with other pollutants of concern, bacteria are generally effectively treated at the point of withdrawal. Ecology may address this further in the finalization of the technical guidance document for UIC facilities.*



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- g. Presumptive and Demonstrative approaches to the UIC Rule. It needs to be made clear that both of these approaches allow injection of stormwater by rule i.e. without a permit for the injection point. There may be some confusion that a community that uses the Demonstrative approach is setting up permit criteria. (I didn't get that confused did I?)  
*RESPONSE: The revised UIC rule will include language stating that one or both approaches can be used to meet rule authorization.*
- h. The Wellhead Protection paragraph in section 5.6.3 should note that we have data that shows bacteria can be transported more than the current set-back of 100 feet through some medium and all low treatment media.  
*RESPONSE: Please provide a specific reference, so we can add this note as suggested.*
- i. The first two exceptions to Tables 5.6.1 – 5.6.3 based on site specific studies should be eliminated. These exceptions assume essentially 100% confidence in knowledge of treatment capability and geohydrologic conditions in assuring non-endangerment. Alternatively actual site-specific data for the site of injection – not within a quarter mile – should be required for each injection point. That is: get a permit.  
*RESPONSE: Ecology will address this comment in finalizing the UIC technical guidance document.*
- j. Several members of the UIC rule Tech group, insisted that since 6 feet or less of “soil” was adequate to protect groundwater under onsite sewage disposal systems, 6 feet should be enough for rule authorization of stormwater injection. The flaw in this logic is twofold. First, it is not universally accepted that drainfield disposal of wastewater fully protects groundwater. Second, each individual on site system requires a permit and inspection. Should the state “rule authorize” nearly all onsites, or should we require permits for nearly all drywells use for SRO disposal?  
*RESPONSE: In finalizing the rule and technical guidance for stormwater UIC facilities, Ecology will review the draft onsite regulations and guidance documents to see what has changed with the intent of providing consistent guidance, or providing appropriate reasoning for any apparent inconsistencies.*
- k. While I agree that source control activities are an effective way to protect ground water from storm runoff contamination, the manual should specify only “source control methods approved by local regulation” as accepted measures. Even the best-intentioned administrator is going to shy away from doing all the needed source control during tight budget periods. I am particularly concerned about the use of de-icing salt solutions. Based in Mikkelson’s work these salts could mobilize metals sorbed on solids and transport them to ground water. Until further research is done, injection should be prohibited in areas where chloride salt de-icers are used. Luckily these are usually high traffic areas where injection is discouraged under the stated requirements.  
*RESPONSE: Will add “approved by local regulation” to both the manual and may also be included in the revised UIC rule.*
- l. Concluding comment: Infiltration and injection of stormwater has become a necessary tool for managing runoff while maintaining some semblance of a

natural water balance. If there were no low cost alternatives to injection of stormwater choosing to incur a higher level of risk of contamination from stormwater might be justified. I and several others from Spokane worked extensively with Ecology to develop the concept of bioinfiltration that will allow the most contaminated runoff to be treated and infiltrated while still using an injection well to handle large events. In the future there will be additional BMP's developed and approved that do more than "remove solids." I believe the occasional stormwater injection well with no pretreatment treatment is appropriate. But I believe these should be the exception not the rule. The conditions included in this section of the Manual applied properly will almost achieve this.

*COMMENT NOTED: Thank you.*

**10. Yakima County (August 20)**

- k. Section 1.4.3, page 1-18, 4th paragraph – The vadose zone issue has not been totally resolved. Using statements like "relying on the vadose zone to remove pollutants may result in contaminated soil..." appears to be speculative and biased against use of stormwater infiltration on projects. Out of many thousands of applications, there are extremely few documented instances where this statement is true. We once again see the "solid phase" of pollutants being related to state water quality standards (many of which were developed during toxicity tests using dissolved pollutants – even if the standard was then written as a total concentration). This is poor technical practice, and it indicates that the specific wording in the RCWs and WACs relating to water quality standards may need to be changed to properly relate to stormwater. We don't believe that Ecology should justify the technically incorrect regulation of solid phase metals composed of naturally occurring soil minerals, by saying that the groundwater or surface water standards were written for total metals. There should be some consideration of how the standards were developed and what the intent of a standard is. We don't believe that the State intends a total metal standard to apply to naturally occurring soil minerals contained in soils, sediments, and bedloads.

*RESPONSE: The basis and requirements of the State's water quality standards are outside of the scope of developing the Manual. Dissolved data are presented where they are available, and comparisons were made only for data and standards that were expressed in the same fraction. The intent of the wording of the paragraph referenced in your comment is to show that there is a potential problem, shown in the body of literature available, which is avoidable by pre-treatment of discharges. This is a prudent and cautionary but not prescriptive statement, and it does not contradict encouraging the infiltration of stormwater where practicable. This comment may be addressed in the process of finalizing the UIC rule and technical guidance.*

- v. Section 5.6.1, page 5-43, 1st sentence – Need to add, "The facilities have to be registered however." The statement is needed to reemphasize that even if the facility is rule authorized, it still needs to be registered.

*COMMENT NOTED: This statement is already included on the previous page in the same paragraph.*

- w. Section 5.6.3, page 5-47, 2nd paragraph. The author states that preferential flow paths will form in sand-gravel mixtures. Two things cause preferential flow paths: macro-pores or spatial variation in hydraulic conductivity. Generally preferential flow paths will not be a concern for most mixed sand-gravel soils. In addition, a further safety factor is the actual processes of sediment bridging and pore size reduction that occurs during filtration processes, and the fact that preferential flow paths will be rapidly plugged with sediment and organic debris that is present in stormwater. This statement about preferential flow paths is the only justification for the improper designation of sand-gravel mixtures as having a low treatment capacity in Table 5.6.1.

*RESPONSE: We disagree that preferential flow paths are not a concern. However, Ecology will address this issue in finalizing the technical UIC guidance.*

- x. Section 5.6.3, page 5-50. It is our opinion that some of the “presumptive” standards developed are not scientifically justifiable. We believe that the proposed “presumptive” standards need further expertise in: (1) physical, chemical, biological treatment processes (2) vadose zone hydraulics, (3) vertical/horizontal fate and transport of trace pollutants, and (4) filtration theory. We strongly urge for an independent scientific review of the UIC standards by an expert agreed upon by the E. WA Steering Committee.

*COMMENT NOTED: As the technical UIC guidance continues to be developed, more expertise will be brought in and the public review process will continue.*

- y. Table 5.6.1. We feel that any soil that behaves like sands or finer soils (including gravelly/sandy mixtures) will effectively treat most raw stormwater runoff in several feet or less (a stormwater sand filter treatment system is only 18 inches deep). This is especially true for stormwater solids. Ecology notes that removal of the solids will effectively treat stormwater in most cases, but then goes on to require 10 feet of silt, 15 feet of fine sand, 50 feet of sandy gravel in order to avoid pretreatment needs (Table 5.6).

*RESPONSE: Ecology has agreed for the interim, with some reservations, that we will continue under the assumption that for most pollutants and in most cases, removal of solids (as is provided by basic treatment or might continue to be reasonably achieved over the long term by the geologic matrix) is appropriate for most land uses, and additional treatment is required in noted circumstances. The depths noted are for wells where on-site geologic data is not available. This issue will be revisited in finalizing the UIC guidance document. See also comment 7.c.*

- z. Section 5.6. While Ecology eventually added some UIC references, no real review/discussion of research literature was done by the UIC committee, nor an assessment of the statistical validity of the small amount of literature that was referenced. The EPA’s own stormwater infiltration study says that there are three main cases that threaten groundwater: (1) intentional misuse of systems (ex: somebody dumping oil or antifreeze into a catch basin), (2) unintentional misuse of systems (ex: washing spilled chemicals from a parking lot into the drain without really thinking about it), and (3) runoff from industrial sites where

chemicals are present (ex: stormwater runoff from areas with poor storage and management of chemicals). It is our opinion that Ecology should have focused their efforts and new standards on these situations and left alone infiltration of normal parking lot, roadway, and residential runoff into all soils finer than clean gravels because of the current lack of evidence that it is a problem.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance. The UIC rule revision advisory committee discussed the EPA study and noted that it focused narrowly on problem issues for which data were readily available. We then reviewed another half-dozen articles, all of which suggested that parking lot and roadway runoff pose potential problems unaddressed by the EPA study. In response to the problems that were identified in the EPA study, the current technical guidance addresses misuse of wells and industrial sites. The UIC rule includes language stating that stormwater can not contain hazardous substances. Stormwater from industrial footprints or from commercial businesses that store or manage chemicals poorly (no best management practices in place) cannot discharge the stormwater from those areas to an UIC well. See also comment 7.c.*

- aa. Section 5.6. As it is, the current approach does nothing to remedy any of the three modes of contamination noted by EPA, at most requiring oil and solids removal. Suggest an independent evaluation of the alternative UIC standards framework presented by John Knutson. This framework was not completely reviewed by Ecology, or discussed by the UIC committee, before Ecology rejected it solely because the depths to groundwater did not “feel” high enough. This framework addressed all three EPA modes, as well as conservative anionic pollutants.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance. The alternative framework was reviewed in its entirety by both Ecology staff and the UIC rule revision advisory committee. Some elements of the framework were included in the guidance proposed in the final draft Stormwater Management Manual for Eastern Washington. See 10.z above.*

- bb. Page 5-50. There is not consistency between septic system siting standards or even the depth to groundwater standard that is proposed by the Western Washington Manual for infiltration ponds (5 ft). Normal stormwater is treated as if it is more hazardous than sewage, how is this justified?

*COMMENT NOTED: See response to 6.c.*

- cc. Page 5-50. Suggest removing the 100 ft set-back from surface waters. The surface water set-back should be a local decision. The justification for a 100 ft set-back is confusing. It seems to say that even if you have enough soil depth (or applied pretreatment) to remove the solid phase of metals and groundwater standards are met by this and chemical reactions, it is still assumed that the infiltrated stormwater will flow up to 100 feet and still contaminate surface water. This is not consistent with any peer reviewed literature about trace metals mobility in soils, that we are aware of. We will have a hard time accepting such speculative standards, especially when direct discharges of minimally treated stormwater (certainly far less treated than what occurs by passing through several feet of soil) to surface waters is allowed.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance. This comment was extensively debated in developing the guidance proposed in the final draft Stormwater Management Manual for Eastern Washington. This issue may be addressed again in finalizing the UIC guidance.*

- dd. Table 5.6 in the Draft Final Manual (Table 5.6) does not reflect the direction of the UIC advisory committee. This Table should be replaced with one that, upon committee request, was revised by two experts on the committee (John Knutson, Kevin Lindsey) and forwarded to Ecology for inclusion in the Manual. We believe the revised Table 5.6 more appropriately designates soil between different treatment categories.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance. The table in the final draft E WA Manual reflects input from the noted members of the committee as well as others.*

- ee. Section 5.6.3, page 5-51, 4th bullet – Suggest you revise the statement on golf courses as follows “ ... UIC facilities should not be located at intensely managed landscape areas such as golf courses, public ball fields and cemeteries, where the use of pesticide and fertilizer is heavily applied.” The statement on the manual is biased against golf courses. There are golf courses now that are using less fertilizer and pesticide.

*RESPONSE: Agree to make the suggested change.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- z. Section 5.6.3, page 5-48: Add statement to contact your local agency for information on well head protection areas located within their jurisdiction.

*RESPONSE: Will add the statement.*

- aa. Throughout chapters 5 and 6: Include statement under these BMPs identifying them as UIC facilities. These facilities, if designed and constructed according to the manual, would be UIC rule authorized, requiring registration of the facility and other UIC rule associated compliance actions. It would be helpful if these facilities were noted as such.

*RESPONSE: Good suggestion. Will add identifying statement to each BMP that is classified as a UIC facility.*

**13. CPM Development Corporation (August 25)**

- d. The requirement that stormwater detention ponds that use infiltration for flow control be a minimum of 5 feet above the ground water will require the creation of exceptionally large facilities. In addition, there are many areas in Eastern Washington, where there is not 5 feet to ground water. Impoundments in these areas next to streams or small bodies of water would actually impair the water flow and quality as many of these small bodies of water rely on stormwater to maintain flow control throughout the year.

*COMMENT NOTED: Infiltration following acceptable pre-treatment (e.g. the discharge meets water quality standards) is still allowable in the situations you describe.*

**14. Stormwater Management Inc. (August 25)**

- f. General Comment: Treatment Facility Menu: Stormwater Management is concerned about a national trend toward the infiltration of stormwater runoff without treatment. Though there are clear benefits toward hydrologic

improvements to the watershed, there is tremendous risk to groundwater contamination or future clean up of contaminated soils. Stormwater Management believes that the previous Ecology manual drafts were more protective of dry wells than the June 2003 edition. Stormwater Management recommends reinstituting the treatment facility menu for dry wells present in Figure 6.2.1 BMP Selection Process and Figure 6.2.2 BMP Selection Process for Discharge to Dry Wells as presented in the August 2002 Final Draft. As the City of Portland, OR has recently come under EPA scrutiny for its dry well protection program, it would benefit Ecology and municipalities to begin implementing a more stringent BMP selection process, as listed in the previous draft versions.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance.*

**15. Building Industry Association of Washington (August 25)**

- e. Drywell Maps: As the Department is aware, the vast majority of construction projects in the larger metropolitan areas of Eastern Washington use stormwater drywells for runoff disposal. Under the SMMEW, underground infiltration wells are allowed under virtually all realistic soil scenarios in Eastern Washington. To the extent there are any areas where drywells would not be allowed under Chapter 5, the Department should create a map for the urban areas of Eastern Washington delineating where drywells may be used. Such a map would create a significant cumulative savings for the regulated community by eliminating much of the additional work and cost associated with following the SMMEW and selecting suitable stormwater treatment alternatives.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance. However, it is unlikely that Ecology will be able to accurately develop such a map in the near future.*

- f. Partial Drywell Exemptions: Project sites that are not high-use and that discharge to underground infiltration wells do not readily fall under Core Elements 1, 4, 5, 6, and 7. Core elements 2 (construction stormwater pollution prevention), 3 (source control), and 8 (local requirements) are sufficient to regulate the use of projects discharging to drywells. The additional overlay of Core Elements is redundant and should be eliminated.

*COMMENT NOTED: Core Element 1 is needed to properly implement all of the other Core Elements. Core Element 4 is beneficial to all development projects. Core Element 5 is only applied per the pre-treatment requirements identified in Chapter 5.6. Core Element 6 does not apply to UIC facilities. Core Element 7 only applies when Core Element 5 or 6 applies.*

**16. WSDOT (August 25)**

- s<sup>5</sup>. Page 5-44, Potential Contaminants in Stormwater Runoff. We think the reference is supposed to be to Section 1.2.1, not 1.2.2.

*RESPONSE: Will make the change. Thank you for the correction.*

- t<sup>5</sup>. Page 5-47, Depth to Groundwater, 2nd sentence. Change fifteen-foot limit to below bottom of drywell, not land surface.

*RESPONSE: Agree to change to 10 to 15 feet below bottom of UIC facility.*

- u<sup>5</sup>. Page 5-50, Exceptions, 1st bullet. Use consistent definition of “shallow water table”. Suggest 10-feet below bottom of UIC facility.



*RESPONSE: Agree to change to 10 to 15 feet below bottom of UIC facility in first and second bullets.*

v<sup>5</sup>. Page 5-51, Special Treatment Requirement, 1st bullet top. Direct reader towards what constitutes a “spill control device”.

*RESPONSE: Agree that reference is needed. Is reference in z<sup>5</sup> below sufficient? Will also add reference to Table 5.6.3.*

w<sup>5</sup>. Page 5-55, Construction Criteria. Registration is not likely prior to use. Suggest changing to within one year.

*RESPONSE: Will consider revising rule language to include registration after installation for transportation sites.*

x<sup>5</sup>. Page 5-56, Table 5.6.1, note at bottom of table. Section 5.6.3 is the narrative not 5.6.2.

*RESPONSE: Will make the change. Thank you for the correction.*

y<sup>5</sup>. Page 5-57, Table 5.6.2. Add “rural roads and highways” after “freeways” on the second line of both Low and Medium pollutant loading descriptions. This was discussed in both the UIC Rule Subcommittee and the Stormwater Technical Team.

*RESPONSE: Will change table to be consistent with the wording in Chapter 2.1.2.*

z<sup>5</sup>. Pg 5-58, Table 5.6.3. Is a separate catch basin sufficient to be a two-stage drywell? The term two-stage drywell seems to imply that the drywell itself has separate stages where in reality it is the catch basin preceding the drywell that pre-treats for solid removal. Should reference the spill control device in Figure 5-10.3 on page 5-102.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance.*

#### **17. Associated General Contractors (August 25)**

- e. The requirement that stormwater detention ponds that use infiltration for flow control be a minimum of 5 feet above the ground water will require the creation of exceptionally large facilities - which will make compliance with urban density requirements under the State Growth Management Act difficult if not impossible.

Discussion of Separation from Groundwater: The requirement that stormwater detention ponds that use infiltration for flow control be a minimum of 5 feet above the ground water will require the creation of exceptionally large facilities - which will make compliance with urban density requirements under the State Growth Management Act difficult if not impossible.

*COMMENT NOTED: Infiltration following acceptable pre-treatment (e.g. the discharge meets water quality standards) is still allowable.*

#### **18. Spokane County (August 25)**

- bbb. Section 5.6.1, Purpose and Definition, Page 5-42: Please clarify that Infiltration Ponds and Trenches, Concentrated Flow Dispersion, etc. are not considered subsurface infiltration facilities?

*RESPONSE: Rule language states the above listed devices are not UIC wells (with the exception of trenches that include perforated pipe. Per suggestion in comment 11.aa, BMPs that are classified as UIC facilities will be clearly identified in the final Manual.*

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ccc. Section 5.6.3, Silting Criteria and Treatment Requirements:

- Subsurface Geologic Data, Page 5-47: This section discusses where geologic information may be available. Spokane County did not find information specifying the thickness of underlying material under a potential drywell in the DNR or USGS sites. If this information is available, this document should also provide some guidance regarding the maximum distance from the borehole log and potential drywell location for the information to be regarded as useful. If this data is available, this section should provide more information to aid the reader in locating the information. If this data is not available, then this section should say that the applicant must to obtain this data through site exploration.

*RESPONSE: Your comment will be considered in finalizing the UIC guidance.*

- Well-head protection, Page 5-48: Specify the minimum vertical separation for the UIC Facility.

*RESPONSE: Will look for default vertical separation requirement.*

- Exceptions Based on Environmental Conditions, Page 5-50: Change land surface to UIC facility in the first two bullets.

*RESPONSE: See 16.t5 and u5. Will make consistent.*

- Pre-Treatment Methods, Page 5-52: Our notes indicate that it was agreed that the last sentence of the first paragraph of this section would be changed to read: “...the vadose zone, will comply with State Groundwater quality standards when it reaches the water table, or first comes into contact with an aquifer (see Chapter 1.3.4 and WAC 173-200).”

*RESPONSE: Agree to make change.*

ddd. Section 5.6.4, Accidental Spills and Illicit Discharges, Page 5-53, 2nd Paragraph: Provide a reference in the last sentence for the regulatory framework to be followed in the event that removal of deep contaminants is not feasible.

*RESPONSE: Will look for appropriate reference and include.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

The Auto Recyclers of Washington thank you and the Department for consideration of our comments related to the draft Stormwater Management Manual for Eastern Washington. Clearly, this Draft Manual reflects a great deal of work by you, others within the Department and members of the Steering Committee.

Please allow us a moment to give you some background about who we are. Auto recyclers – commonly referred to as auto wreckers – play a vital and critical role in protecting the environment and controlling costs in Washington State. Each year, over 400,000 motor vehicles are discarded by Washington citizens. If lined up end to end in a single lane on Interstate 90 starting in Seattle, the line would reach beyond Rapid City, South Dakota, and it would take you about 18 hours driving at 70 MPH to go from one end to the other end of that line.

The cost to dispose of these discarded vehicles far exceeds \$40 million per year in Washington State. Auto recyclers receive no money from government agencies,



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no money from vehicle manufacturers and no money from consumers to dispose of discarded motor vehicles. Vehicle recyclers generate money from the sale of used vehicle parts to fund the disposal of these vehicles, plus they create jobs and protect the environment.

By re-using disposed of vehicle parts, auto recyclers carry out the HIGHEST priority in disposing of waste under Washington State's dangerous waste and solid waste laws. Converting disposed vehicles to re-useable vehicle parts is the highest priority in waste handling under both state and federal law. Re-use is a higher priority than is recycling. Understand that the vehicles discarded by citizens contain oils, anti-freeze, and other fluids that, if not properly removed and handled can result in the contamination of stormwater, surface water and groundwater. The vehicle recyclers do not generate these fluids; the owner of the vehicle prior to discarding of the vehicle generated these fluids. In spite of this, the vehicle recyclers remove, store and even recycle most of these fluids, and they properly dispose of the rest.

We tell you all of this so you will understand the HUGE importance the vehicle recycling industry plays in Washington State with the hope that you will this into consideration in your final deliberations on elements of this Manual that affects auto recyclers.

One final thought . . . the vehicle recycling industry is in currently serious trouble. Every year for the past ten years, more and more vehicle recyclers have left the business, and fewer and fewer remain to handle the disposal of vehicles. However, the number of disposed vehicles is increasing. Additional regulatory costs on this industry will lead to fewer and fewer vehicle recyclers continuing in business in the future.

Let us move on to the specific comments on the Draft Stormwater Management Manual for Eastern Washington.

- g. UIC Facilities 5.6.5 – Prohibitions. We understand from discussions with those preparing this Manual that vehicle recycling facilities that do NOT have fluids removal or parts removal activities exposed to stormwater may have a UIC. Comment: We support this position  
*COMMENT NOTED: Keep in mind that the no exposure form must be completed, which asks if stormwater comes into contact with hazardous substances. Vehicle fluids would be a hazardous substance. If the stormwater does not come into contact with hazardous substances, or they are not used, stored or managed on site, then a UIC well can be used if the other requirements of the regulation are followed.*
- h. UIC Facilities - 5.6.3 – Siting Criteria and Treatment Requirements Based on discussions with Department representatives, we understand that if a vehicle recycling facility does NOT have fluids removal or parts removal activities exposed to stormwater, they are not required to have pre-treatment of their stormwater before entering a UIC. Comment: We support this position  
*COMMENT NOTED: See response to your comment g above.*
- j. UIC Facilities – We understand that the UIC facility provisions for this Manual will be applied statewide Recommendation: The Department should prepare a separate UIC Facilities Manual from this Eastern Washington

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Stormwater Management Manual, for UIC Facilities for two important reasons:

- It will be far less confusing to people in western Washington who will be required to comply with the UIC provisions of this Manual to understand that fact when the information is contained in the Eastern Washington Stormwater Management Manual.
- It will be far less costly and far better for the environment (less drain on resources and energy) to establish a separate manual rather than having to reprint all of the Western Washington Stormwater Management Manuals to include the UIC provisions which will be used to a limited extent. Instead, the Department can send out a one-page addendum to the Western Washington Stormwater Management Manual informing affected parties of the new UIC Manual.

*RESPONSE: As noted at the beginning of this document, Ecology intends to continue to develop a separate statewide guidance publication in a parallel process to finalizing the rule.*

**Chapter 6**

**4. Department of Ecology (July 30)**

- k. In the Final Draft Stormwater Management Manual for Eastern Washington (June 2003), Dam Safety's jurisdiction over large stormwater impoundments is mentioned in Section 6.2, Detention Facilities, sub-section 6.2.1, Detention Ponds, on page 6-1; and in Section 5.7, Wetpool Facilities, sub-section 5.7.3, Design Criteria, Embankments, on page 5-65. The locations and text for these items are appropriate and adequate.

*COMMENT NOTED: Thank you.*

**5. Low Impact Development Center (August 11)**

- a. It might be worth mentioning that, in general, to meet a given peak flow control target, the optimal placement of multiple small-scale retention/infiltration facilitates within a drainage area will require less total storage capacity than a detention pond that might otherwise be used at the drainage area outlet. We have a paper in the works to describe the basic design concept. A draft manuscript should be ready in a few days if you wish to review a copy.

*RESPONSE: Will add the note.*

**9. City of Spokane (August 20)**

- m. Page 6-32, Section 6.3.3, we are disappointed that much of the related infiltration material has been deleted from the manual. We propose that you reevaluate the information including tables prepared for this document and give us a starting point for future revisions. (Regionally, there is ongoing work funded by Spokane County and the City of Spokane to better support tabled data for various soils characteristics vs. infiltration.)

*COMMENT NOTED: The presumed infiltration rates that were published in the first draft of this Manual were removed from the final draft Manual because they were not tested, and known failures had occurred in some jurisdictions. See specific WSDOT notes related to infiltration – they may develop and include an alternative method and guidance in their updated Highway Runoff Manual.*

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*Presumptive infiltration rates may also be made available for parts of eastern Washington after they have been tested.*

- n. Page 6-53 this page generally refers to a Full Dispersion BMP derived from the SWMMWW. What happened to the BMP being developed by WSDOT and why has this been inserted instead?

*RESPONSE: That BMP was not completed and also would not apply to non-road projects. The subcommittee requested a dispersion BMP that would apply to other projects. Will add note that such a BMP may be developed and included in the revised HRM.*

**10. Yakima County (August 20)**

- ii. Chapter 6 – Flow Control Facility Design: General Comment – the sources of tables and figures were not cited. Is this a copyright problem?

*RESPONSE: Need to double-check these and reference them all. Figures from public sources do not provide copyright problems but should still be referenced.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- aa. Throughout chapters 5 and 6: Include statement under these BMPs identifying them as UIC facilities. These facilities, if designed and constructed according to the manual, would be UIC rule authorized, requiring registration of the facility and other UIC rule associated compliance actions. It would be helpful if these facilities were noted as such.

*RESPONSE: This is a good suggestion. Will identify as suggested.*

**16. WSDOT (August 25)**

- j<sup>6</sup>. Page 6-1, Dam Safety. Is only required if volume is above natural ground.

*RESPONSE: Your comment is correct with the following clarifications: 1) Per WAC 173-175-030, definition for dam height, natural ground elevation is measured from the downstream toe of the dam, and 2) If a trench is cut through natural ground to install an outlet pipe for a spillway or low-level drain, natural ground elevation is measured from the base of the trench (where the natural ground remains undisturbed). Suggest this clarification be added to the text.*

- k<sup>6</sup>. Page 6-1. Detention ponds should state again the design event to release 1/2 of the 2-year and pre-developed 25-year flows and any other criteria set by the jurisdiction.

*RESPONSE: Agree to add statement.*

- l<sup>6</sup>. Page 6-2, Design Criteria, General, last paragraph. Add a sentence about checking local critical area ordinances for unstable slopes. Does stating minimum setbacks imply any liability if it does not work? There may be situation where setback greater than h is not safe. In general though, this wording (with improvements) is better than what appears in the Quality Treatment section and should be mimicked in other areas as appropriate.

*RESPONSE: Agree to make change and will check treatment facility section.*

- m<sup>6</sup>. Page 6-4, Emergency Overflow Spillway, 3rd paragraph, first sentence. Remove “with riprap” from the end of this sentence. It may be armored with a different material.

*RESPONSE: Agree to change to “with riprap or other suitable material.”*

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- n<sup>6</sup>. Page 6-29, Use of parking lots. Why only private parking lots and why does the manual care how deep the water in it gets?

*RESPONSE: Agree to remove “private” and note that the maximum depth is suggested (local requirements may apply); will also add a 5<sup>th</sup> statement that a downstream treatment facility with absorptive oil control removal is also needed.*

- o<sup>6</sup>. Pages 6-29 to 6-45, Section 6.3 Infiltration of Stormwater for Quantity Control. There is insufficient information in this section to determine infiltration rates for infiltration BMPs and thus to design and construct infiltration facilities and their related components (overflow spillway, etc.). If the design guidance can be found elsewhere in the manual then they should be cross-referenced. As a general rule, it would be more useful if all of the design criteria and related formulas necessary to size and configure a facility (with the exception of hydrology and hydraulic analysis) were included within the BMP section rather than having to find all of the components throughout the manual. In addition, see specific infiltration comments specifically addressing infiltration design. Also, we feel that the Underground Injection Code (UIC) criteria for vadose zone treatment capabilities and pollution loadings should also be adapted to the manual’s guidance for surface infiltration facilities.

*COMMENTS NOTED: Some are addressed where made elsewhere.*

- p<sup>6</sup>. Page 6-30, These Setbacks..., 2nd bullet. Change “Additional Setback must . . . .” to “. . . should” . . . .” WSDOT has constructed infiltration facilities with the cooperation of the Department of Health in Spokane and has consistently used 100 feet as the guideline for setbacks from drinking supply wells.

*COMMENT NOTED: States “must be considered...” ; entire section is provided as guidance (also stated). There are locations where larger setbacks are appropriate.*

- q<sup>6</sup>. Page 6-32, Section 6.3.3 Determination of Infiltration Rates. Table 5.4.1 is intended for quality ponds, coarser material should be included in a table that addresses infiltration rates for quantity treatment. Also see specific infiltration comments.

*COMMENT NOTED: Subcommittee decided in response to first round of public comments to remove first draft table 5.3.5 and reference Table 5.4.1 here.*

- r<sup>6</sup>. Page 6-33, Maintenance Criteria, 2nd bullet. Remove “every 6 months or” from the criteria. The rest of the verbiage is adequate.

*COMMENT NOTED: Bullet provides prudent guidance and allows flexibility as is.*

- s<sup>6</sup>. Page 6-34, Drywells. Outflow capacity is not addressed. Add a note to check with the local jurisdiction. Our thought is that perhaps it should be addressed similarly to the way infiltration rates for surface BMPs are addressed.

*RESPONSE: Agree to add note to check with local jurisdiction for outflow capacity requirements; also need to change this section to bullet format for consistency.*

In the Design Criteria, remove the statement about not being built on slopes greater the 25 percent as it is covered in statement below.

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*COMMENT NOTED: Statement provides upper limit and is not redundant.*  
Also the statement on spacing is not clear. What is a free flowing soil and what depth is it referring to – the soil or the drywell?

*RESPONSE: This change was made in response to comment #39 City of Spokane 23. Will strike “free flowing soil.”*

- t<sup>6</sup>. Page 6-38, Design Criteria for Infiltration ponds. What is the acceptable method for calculating Q out? The manual gives detailed directions on hydrology and some aspects of hydraulic design. Why not for infiltration? Again, table in Section 5.4.1 is insufficient for determining infiltration rates.

*RESPONSE: Agree that design criteria are needed for the outflow rate. Suggest that the reference to Table 5.4.1 in the Description section above be moved to the design criteria section.*

- u<sup>6</sup>. Page 6-38, Maintenance Criteria for Infiltration ponds. Mowing is not done to native dryland bunch grasses used as typical erosion control grasses in eastern Washington.

*RESPONSE: Will change to: “Mowing twice a year is generally satisfactory for cool season grasses; native warm season grasses should be mowed once every three years to stimulate growth.” This statement will be confirmed with NRCS.*

- v<sup>6</sup>. Page 6-40, BMP F 6.22. If perforated pipe, then this BMP is subject to UIC registration.

*COMMENT NOTED: Per prior suggestion, BMPs subject to the UIC rule will be identified in the final Manual.*

- x<sup>6</sup>. Page 6-46, Evaporation Ponds. There should be more specific step-by-step instructions on how to design an evaporation pond. The web site has limited coverage throughout the state. Need a better resource. Also, how do you apply a single event CN number to a monthly average rainfall amount to get runoff? Same comments for parking lots as for detention ponds.

*RESPONSE: Spokane County may provide a spreadsheet or other additional guidance. Otherwise, no specific suggestions made (including for parking lots as detention ponds).*

- z<sup>6</sup>. Page 6-51, BMP F6.41, Design Guidelines. Do the criteria in the last two sentences of the fourth bullet apply to the third bullet also? It is not clear.

*RESPONSE: Agree that a similar statement should be added to prior bullet. Also correct typo: “additional 20 feet...”*

- a<sup>7</sup>. Page 6-53, BMP F6.42, Applications and Limitations. Remove “forested” in second bullet.

*RESPONSE: Will change to “natural forested or other native vegetation...”*

- c<sup>7</sup>. Page 6B-1. Does not provide a sufficient guidance for what field method or design approach should be used to determine the appropriate infiltration rates. We have provided comments and recommendations on the process in the attached infiltration comments.

*COMMENT NOTED: See comment 18.mmm.*

- r<sup>7</sup> Section 5.4.3, Design Infiltration Rate Determination: This section provides presumptive infiltration rates based on soil classification for treatment facilities, but refers to Chapter 6 for infiltration rate determination for flow control facility

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determination. While I agree that Chapter 6 is the right place for infiltration rate determination for flow control facilities, currently Chapter 6 provides no information on how to do this, other than referring to Appendix 6B, which provides geotechnical investigation requirements.

*COMMENT NOTED: See comment 18.mmm.*

- s<sup>7</sup> Section 5.4.4, Best Management Practices (BMP's) for Infiltration and Bio-Infiltration Treatment, BMP T5.10 Infiltration ponds, Design Criteria: It states that "Design of infiltration ponds for water quality treatment is identical to the criteria given in Section 6.3.6 (BMP F6.21, p. 6-38), except that the allowable infiltration rate is limited to 2.4 in/hr or less." There is nothing in Section 6.3.6 that provides guidance on the determination of design infiltration rates for flow control facilities. Instead, Section 6.3.6 refers to Table 5.4.1 for design infiltration rates. It appears that infiltration rate guidance is missing in Section 6.3.6. See comment #r<sup>7</sup> above. This comment also applies to BMP T5.20 for infiltration trenches.

*RESPONSE: Agree to change reference to Appendix B1; see comment 18.mmm.*

- t<sup>7</sup> Section 6.3.3 Determination of Infiltration Rates, p. 6-32, Second paragraph: States that "infiltration rates for surface BMP's are shown in Table 5.4.1." The rates provided in that table apply to treatment facilities, not flow control facilities. In particular, that table does not provide infiltration rates for sands and gravels. Therefore, no guidance is provided in the manual for infiltration in sands and gravels.

*COMMENT NOTED: Appendix 6B is also referenced. See comment 18.mmm.*

- x<sup>7</sup> Appendix 6B: In point 2, it states that the minimum depth of exploration below the pond should be 5 ft. This is woefully inadequate, considering that the soil stratigraphy and water table location within a depth of 10 to 50 ft or more can influence the infiltration rate. This recommendation is also not consistent with the Western Washington Stormwater 2001 manual. What makes Eastern Washington different that would justify shallower soil exploration? In general, the guidance in this appendix falls short of what is required in the Western Washington manual. Why should Eastern Washington be different regarding the level of investigation required?

*RESPONSE: Will state that deeper site exploration (10-50 feet) may be needed if well logs are not available. See also comment 18.mmm.*

**18. Spokane County (August 25)**

- hhh. Section 6.2.1, BMP F6.1 Detention Ponds, Design of Access Road: A turnaround should be required at the terminus of the road. In addition, these guidelines should specify a minimum section for the access road, such as 6" of crushed surfacing top course. Our guidelines require that the driveable surface shall be designed to carry the load of a 48,400 truck with a 20-year surfacing design life, assuming 3 trips/year.

*RESPONSE: Agree to add truck turnaround provision.*

- iii. Section 6.3.5, BMP F 6.20 Drywells, Page 6-34: How is the outflow rate for the drywells determined?

*RESPONSE: See response to comment 16.s<sup>6</sup>.*

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- jjj. Section 6.3.6, BMP F 6.21 Infiltration Ponds, Page 6-38: It seems that use of a filter fabric on or near the pond bottom would reduce infiltration along the pond bottom and reduce the potential for treatment.

*COMMENT NOTED: Lining material is not required and bullet addresses plugging.*

- kkk. Section 6.4 Evaporation Ponds, Page 6-46: This section should provide with steps to guide the designer to size an evaporation pond. These steps are provided for several BMPs and it seems that for consistency and clarification they should also be added in this section. Spokane County offered to provide this information but has not determined what level of detail would be appropriate. Please let us know if you would like us to pursue fulfilling this request.

*RESPONSE: Spokane County will provide the information with a spreadsheet and a description and we will include it in the final Manual; the spreadsheet will be posted on Ecology's website and included on the CD.*

- lll. Section 6.5.3 BMP F6.42 Full Dispersion, Page 6-53:

- It appears that the required ratio of impervious surfaces to preserved native vegetation would make the circumstances when this BMP can be used very limited. Is this the intent?

*RESPONSE: The BMP was intended for areas of new development, generally in rural areas where land is available to be set aside for this purpose. The scaling (top of p. 6-54) allows for use at more sites than the original BMP. WSDOT is working to develop guidance for full dispersion for road projects. Will add a note that the revised HRM may include a suitable BMP for roads.*

- Cleared Area Dispersion BMPs, Page 6-56, Item 2: Can the adjustment be made for slopes up to 15%? Or what is the maximum?

*RESPONSE: Agree that a maximum is appropriate. Suggest 15% as max.*

- mmm. Appendix 6B, Page 6B-1: This text was taken from Spokane County's Appendix I. As requested, a full copy of it was provided with the previous comments. Will the entire document be implemented at a later date?

*RESPONSE: The full text will probably be more helpful than the single-page summary. Agree to include. Please supply an electronic version if available.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- f. UIC Facilities – 6.3.1 – Applications. In SSC-4, it states that the infiltration system must be drained within 72 hours after flow into it has stopped.

Recommendation: Provide a specific size storm event for this requirement to apply to for small facilities. See our comments under Section 4 - Hydrologic Analysis and Design.

*COMMENT NOTED: Local jurisdictions may provide simple stormwater site plans for use by small businesses that would include basic facility design specifications.*

- 24.** Additional comment from 9/11 meeting: The consultant team lead had a list of other items that were to be addressed or provided by others. Here is the status for the items in Chapter 6:

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- 33 Spokane Co. #17b – Consider adding spreadsheet example (or math calculations in text of manual) for design of evaporation ponds.  
*STATUS: See 18.kkk.*
- 30 Yakima #6 – Consider adding detail showing a shut-off valve upstream of an infiltration trench (BMPs T5.20, p. 5-31 and F6.22, p. 6-40).  
*STATUS: Suggested detail was not added to final draft Manual and no further comments were made. No change made; will drop.*
- Review/update section 6.5 on Natural Dispersion as requested by subcommittee.  
*STATUS: These BMPs were revised and a full dispersion BMP was included in the Final Draft with a note that it had not been reviewed by the subcommittee. Comments 9n, 16.a<sup>7</sup>, and 18.iii addressed the full dispersion BMP.*

**Chapter 7**

*(note that this set of comments addresses all of the comments relating to Construction Stormwater Pollution Prevention, including comments on Chapters 1.3.3 and 2.2.2)*

**4. Department of Ecology (July 30)**

- n. Chapter Seven p 7-17 and 7-18 Element 5 bullet 2 gives time lines for stabilization, but bullet 5 does not and bullet 6 gives a maximum based on rainfall. Recommend that bullets 5 and 6 be deleted for consistency.  
*RESPONSE: Agreed – Bullets 5 and 6 will be deleted.*

**10. Yakima County (August 20)**

- g. Section 1.3.3, page 1-13, 2nd paragraph – add “that flows to surface waters” after “storm drain”.  
*RESPONSE: Agreed – “that flows [or discharges] to surface waters” will be added. To be consistent, Section 1.3.3, page 1-13, 1st paragraph should also apply the same language; “used to convey water to a stream, lake, or wetland” will be replaced with “that flows [or discharges] to surface waters”. See also comment 18.a.*
- o. Section 2.2.2, page 2-11, 1st paragraph – Use “SWPPP” instead of SWPP.  
*RESPONSE: Good catch; this will be corrected.*
- jj. Chapter 7 – Construction Stormwater Pollution Prevention: Section 7.2.1, page 7-10 – Need to be clear when a SWPPP or drainage plan needs to be stamped by a P.E. *RESPONSE: A review of WAC 173-240 (excerpts below) indicates that plans and specifications that involve “structures, equipment, or processes required to collect, carry away, treat, reclaim or dispose of industrial wastewater” including “contaminated stormwater” must be prepared under the supervision of a professional engineer (P.E.). Within the context of Construction SWPPPs, the portions of the plan that deal with structural BMPs to “collect, carry away, treat, reclaim or dispose of” stormwater from the area of construction activity such as sediment ponds, channels, and pipe slope drains need to be stamped by a P.E. However, the portions of the SWPPP that do not directly pertain to BMPs that “collect, carry away, treat, reclaim or dispose of” stormwater, e.g. mulching, nets and blankets, seeding, buffer zones, do not necessarily have to be stamped by a P.E. It is recommended that a paragraph be added to Section 7.2.1 to reflect this requirement.*



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**WAC 173-240-160 Requirement for professional engineer.** (1) All required engineering reports, and plans and specifications for the construction or modification of wastewater facilities must be prepared under the supervision of a professional engineer licensed in accordance with chapter 18.43 RCW. All copies of these documents submitted to the department for review shall bear the seal of the professional engineer under whose supervision they have been prepared.

**WAC 173-240-020 (9) "Industrial wastewater facility" means all structures, equipment, or processes required to collect, carry away, treat, reclaim or dispose of industrial wastewater.**

**WAC 173-240-020 (8) "Industrial wastewater" means the water or liquid that carries waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feedlots, poultry houses, or dairies. The term includes contaminated stormwater and also leachate from solid waste facilities.**

- kk. Section 7.2.1, page 7-10, second paragraph – You need to define “reasonable access” or be clearer because it will have wide interpretation.

*COMMENT NOTED: Good comment, but the recommended change is not suggested at this time. The current Construction Stormwater General Permit uses the same terminology – “SWPPPs are not submitted to Ecology but retained on-site or within reasonable access to the site to be made available to Ecology and local governmental agencies upon request”. I agree that “reasonable access” could be subject to interpretation, but defining a more specific distance or timeframe doesn’t seem appropriate considering the spectrum of construction activities in Eastern Washington. The intent was to allow flexibility for those sites that cannot retain their SWPPP on-site due to an irregular or intermittent construction schedule or for those site that do not have a trailer or on-site office where the SWPPP can be kept. Often the SWPPP is kept in the truck of the person designated as the site’s erosion control lead who is required to be available by phone 24 hours a day. It will be necessary for the local jurisdiction or permitting authority to use professional judgment when applying the “reasonable access” definition to a specific situation.*

- ll. BMP C120, page 7-47 – Need to double check on the seed mix by experts like WSU Agriculture. Has this been done?

*RESPONSE: This section was revised by a Landscape Architect with David Evans & Assoc. in consultation with a Spokane based seed company. The WSU/NRCS Plant Materials Center in Pullman was contacted recently for input on this issue and they provided Ecology with excerpts from the WA & OR Guide for Conservation Seedings and Plantings, Sept. 1999 (Guide). The Guide lists erosion control seed mixes for various regions based upon annual precipitation: <12”, 12-15”, 15-18”, 18-24”, and >24”. However, the lists include both native and introduced species.*

*NRCS is in the process of a revising the guide, which will place additional emphasis on native species in the erosion control mix. It is recommended that this BMP be revised to include various seed mixtures, as recommended by NRCS and other local experts. Language also needs to be added to emphasize the need to consult local vegetation experts to ensure that revegetation efforts*

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*are based upon current agronomic practices and take into account site specific conditions such as soils, climate, critical slopes, etc.*

mm. General – need guidance on the Erosivity waiver.

*RESPONSE: It is expected that the Small Construction General NPDES Permit will include provisions for operators of sites smaller than 5 acres to request a waiver from NPDES permitting requirements. The manual will contain general information about this proposed permit condition in Chapter 1.3.3, including a web address that will help project proponents determine if their site qualifies for the waiver; the address is <http://ei.tamu.edu/index.html> . Note: this waiver only applies to sites with less than 5 acres of soil disturbance.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

c. Section 1.3.3, page 1-13: The Construction Permit is directly tied to discharges to surface water. This is inconsistent with the Ecology proposed combined permit which also addresses groundwater. It is also inconsistent with Core Element #2 which requires a SWPPP for discharges to groundwater. These contradictions make it difficult for local agencies to require SWPPPs for discharges to groundwater.

*COMMENT NOTED: Agree that this is awkward, but no change is suggested. The perceived inconsistency is partially rooted in Ecology's policy to not require General Permit coverage to construction sites that discharge only to ground, if there is no discharge to surface water. However, the trigger for when NPDES permit coverage is required for >1 acre construction sites is the discharge of stormwater to surface waters; this relates back to the Clean Water Act definition of "waters of the US", i.e. surface water, but not ground water. However, once permit coverage is obtained under the [combined] Construction NPDES and State Waste Discharge General Permit, any discharges to ground are also regulated under the State Waste Discharge Program (RCW 90.48) which has authority to regulate discharges to all "waters of the state", which includes ground water.*

bb. Section 7.2.2, page 7-17: Under element #5, correct references to Figure 1.B

*RESPONSE: Good comment; this will be corrected.*

**13. CPM Development Corporation (August 25)**

e. Under the current NPDES General Sand and Gravel Permit, state wide monitoring over the past several years hasn't shown any significant adverse impact of sand and gravel, concrete or asphalt operations on stormwater contamination. Our industry is already regulated by this permit and additional regulations would only add to the financial and operation burden without just cause.

*COMMENT NOTED: Ecology has documented stormwater contamination at a number of permitted sand and gravel operations, but overall, the industry's compliance record is good. However, federal law requires NPDES permit coverage for all discharges from industrial activities, including construction, sand and gravel, concrete and asphalt operations. In Washington State, construction activities and sand and gravel operations are regulated under separate General Permits and it is not likely that the two permits will be combined.*

- g. The State Building Code Council Erosion Control and Spill Prevention Guidelines are much more clearly articulated than the equivalent BMP's described in Chapter 7 of the Stormwater Manual. The Guidelines should either be incorporated into Chapter 7 of the SMMEW, or adopted as equivalent to the appropriate BMPs in Chapter 7.

*COMMENT NOTED: This subcommittee discussed the proposed Model Ordinance in June-July 2002 and determined that it was not a helpful document in developing this Manual. Ecology commented on the Model Ordinance with concerns about potential confusion for local governments, because the guidance as written does not fulfill federal Clean Water Act requirements.*

**15. Building Industry Association of Washington (August 25)**

- d. Inclusion of Waivers for Low Rainfall or TMDL/Instream Flow Considerations: Under federal Clean Water Act regulation of construction activities (Phase II, January 2001), waivers are possible from pollutant discharge programs in instances of low predicted rainfall potential. This is known as the rainfall erosivity waiver, and is based upon the rainfall erosivity factor (R in the Revised Universal Soil Loss Equation). If the factor is less than 5 during the period of construction activity, the site is exempt under federal law.

It is likely that during the arid construction season in Eastern Washington, many projects would qualify for a waiver under the rainfall erosivity equation. Given the tremendous cost-savings of this feature for geographical and climatological region like Eastern Washington, it is irresponsible for the Department not to include such a waiver in the SMMEW.

Additionally, under federal law, a waiver can be secured if there is a determination that stormwater controls are not necessary because a TMDL addresses the pollutants of concern or an equivalent analysis determines that allocations are not needed to protect water quality based on consideration of instream concentrations, expected growth in pollutant concentration from all sources, and a margin of safety. Although this waiver contains a more complicated analysis than rainfall erosivity, the Department should include waivers to the full extent allowed by federal law in order to provide maximum flexibility and cost-savings to developers while protecting water quality.

*RESPONSE: The erosivity waiver will be included in the Manual as discussed in the response to comment 10.mm above. At this point, Ecology does not intend to implement the other waiver in the Statewide General Construction Permit because the required data are not available. The subcommittee requested that Ecology include more information about the TMDL waiver in the response to comments on policy issues.*

**16. WSDOT (August 25)**

- d<sup>7</sup>. Page 7-11, BMP Selection and Specifications. References to Chapter 7 within Chapter 7 should be eliminated.

*RESPONSE: We agree that these should be deleted.*

- e<sup>7</sup>. Page 7-15 to 24, Elements 1-12. There are many reference to "shall" within these elements. Many should be changed to "should". Also there are many references to "local permitting authority". This reference should be change to "jurisdiction" or add "or contracting agency". WSDOT maintains jurisdiction

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within its own right-of-way. *RESPONSE: The “shall” references will remain unchanged; keep in mind that Page 7-15, Step 3, contains provisions for exemptions and flexibility when selecting BMPs to implementing each element. “Local permitting authority” will be replaced with “jurisdiction.”*

- f<sup>7</sup>. Page 7-15, Elements 1, 1st bullet. Many times it is impractical on road construction projects to limit access to one or two locations. To do so may force vehicles to drive on existing vegetation, which should be preserved to the maximum extent possible. We suggest the following change: “Construction vehicle access and exit should be limited to one route if possible, while linear projects (e.g., roadways) should be limited to as few as necessary.”

*RESPONSE: Will change text as suggested.*

- g<sup>7</sup>. Page 7-17, 1st bullet. Change “seeded and mulched” to stabilized as per Element #5 as there are other methods that may be used.

*RESPONSE: Agree to make suggested change.*

- h<sup>7</sup>. Page 7-17, Element #5 Stabilize Soil. Is the first bullet even necessary? It is repetitive of the second bullet on the same page.

*COMMENT NOTED: We agree that some aspects of the bullets are similar, but they convey different messages. Bullet 1 requires soils to be protected, using effective BMPs, as soon as practicable; while Bullet 2 sets forth the maximum time frames for leaving soils exposed.*

The blanket time limits for soil stabilization are not appropriate for eastern Washington. Time limits must depend on individual site conditions. As written, time limits put too many constraints on how a typical WSDOT road project is constructed in eastern Washington. The time limit adjustment language in the second bullet should be changed to the mimic the language in *Element #12* at the bottom of page 22. WSDOT proposes the following language:

“The combination of local weather conditions plus site conditions, such as surrounding topography, soil type, proximity to water, size and nature of construction activity, and proposed erosion/sediment control measures, dictates time exposure limits of soil not being actively worked. Where these factors present a low to moderate risk, soil exposure limits will be determined by the jurisdiction. Where these factors present a high risk, the following limits should apply:

For projects in Regions 1,3 and 4 of Eastern Washington, erodible soil not being worked, whether at final grade or not, should be stabilized using approved practices.

July 1 through September 30	10 days
October 1 through June 30	5 days

For projects in the Central Basin region 2 of Eastern Washington (areas receiving 12 inches or less of annual precipitation), erodible soil not being worked, whether at final grade or not, should be covered using approved soil cover practices.

July 1 through September 30	30 days
October 1 through June 30	15 days”

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*RESPONSE: The proposed language would require jurisdictions to have the resources and expertise to perform a risk assessment at every active construction site in order to establish site-specific soil stabilization timeframes. Jurisdictions may do so but these are provided as a “stabilize as soon as practicable, not to exceed...” default approach. The maximum soil stabilization timeframes proposed are based upon the probability of a .25"/24 hour storm event occurring during various time periods. Periods where the probability exceeded 10-20% were tallied for many rain gauge locations around Eastern Washington. This analysis took into account the seasonal and regional differences in storm frequency. If soils are effectively stabilized using the timeframes set forth, disturbed soils will be protected during .25"/24 hour storm events 80-90% of the time. This appears to be a reasonable safety margin. This section of the Manual will also note that the greatest potential for erosion, particularly in the driest parts of eastern Washington, is during summer thunderstorms.*

WSDOT maintains the responsibility for projects within its right-of-way and is, in essence, a local jurisdiction. Therefore, WSDOT recommends that the phrase “local permitting authority” be changed to “local jurisdiction” or something similar to allow large entities to manage their projects in a reasonable and responsible manner. *RESPONSE: Agree to replace “local permitting authority” with “jurisdiction”.*

- i<sup>7</sup>. The third and fourth bullets on page 7-18 appear either contradictory, or confusing at best, with the time exposure limits outlined on page 7-17. WSDOT recommends that they be eliminated.

*RESPONSE: Bullets 3 and 4 will be deleted.*

In general, many bullets are repetitive and/or confusing. This entire section should be reviewed for clarity and conciseness to promote ease of understanding and improve implementation of BMPs.

*COMMENT NOTED: This section was reviewed and no specific change is suggested. It is recommended that the commenter make specific suggestions on how to improve clarity and conciseness where necessary.*

- j<sup>7</sup>. Page 7-20, Element #7 Inlet Protection. Six inches may or may not be the appropriate height for all inlet protection devices for removal of accumulated sediment. Suggest changing to “as needed or as specified by the manufacture”. The WSDOT Standard Specifications book says: “one-half the height for internal devices and one-third the height for external devices or as specified by the manufacture”.

*RESPONSE: We agree that 6” may not be appropriate in all situations, but “as needed” is somewhat ambiguous and more specific standards are appropriate. It is suggested that the element be revised using the WSDOT maintenance spec as follows: “Inlets should be inspected weekly at a minimum and daily during storm events. Inlets protection devices shall be cleaned or removed and replaced before sediment can accumulate to one-half the height for internal devices and one-third the height for external devices or as specified by the manufacturer.”*

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- k<sup>7</sup>. Page 7-20, Element #8 Stabilize Channels and Outlets. Should change design event to include short-duration storm.  
*RESPONSE: The design event for channels will be changed to the 6-month, 3-hour storm, referred to as the short-duration storm in Chapter 4.*
- l<sup>7</sup>. Page 7-22, Element #11 Maintain BMPs. Should eliminate separate daily requirement for inspection during the “wet” season. The weekly and after runoff producing events inspections are sufficient.  
*RESPONSE: Agree with the comment. The following language is suggested: The site inspections shall be conducted every day daily when there is a discharge from the site (stormwater or non-stormwater), and at least weekly when there is no discharge.*
- m<sup>7</sup>. Page 7-22, Element #12 Manage the Project. How does the first section apply to public works projects?  
*COMMENT NOTED: The concept of phasing grading and clearing where feasible should apply to all projects, not just subdivisions. It is suggested that this section be revised to include language appropriate for public works projects. It would be great if the commenter could propose some language applicable to public works projects. The subcommittee suggests that WSDOT come up with alternative language in revising the Highway Runoff Manual.*
- n<sup>7</sup>. Page 7-33 BMP C101 Preserving Natural Vegetation. Is the reference to conifers appropriate in the eastern Washington manual?  
*COMMENT NOTED: Yes. Many areas in Eastern Washington have conifers.*
- o<sup>7</sup>. Page 7-44, Design and Installation Specifications Second bullet. Change to: “The optimum seeding window for eastern Washington is October 1 to November 15. Any seeding outside that window will require temporary irrigation through the first two growing seasons.” Reasoning: Any seeds that sprout in the spring will not have developed enough root system or be hearty enough to survive the first summer. Grasses (and other plants) seeded earlier than October, without irrigation, either dry out or get eaten by birds and rodents. The WSDOT Standard Specifications have been changed to reflect the above dates with the next publication. WSDOT has had good success with seeding between October 1 and November 15.  
*RESPONSE: Good comment and logical reasoning. Initial contact with local revegetation experts indicates that successful seeding may also be conducted well into the winter and, in some cases, spring seeding may also be successful depending on soil moisture. BMP will state that May through August are inappropriate months for seeding; that the **optimum** window for seeding is October 1- November 15; and that the **acceptable** window for seeding is September 1 through April 30, but depending on site location, additional irrigation may be required. We will coordinate with NRCS and other experts before finalizing this BMP.*
- p<sup>7</sup>. Pages 7-47 through Table 7.3.5 on page 7-49. Tables on these pages contain non-native grass species. Except for Table 7.3.2 Landscaping Seed Mix, they should all be changed to contain native species with the exception of Regreen or Annual Rye. There are many native grass and forb species that will do well in eastern Washington without transitioning to non-native species. WSDOT is

surprised that manual would recommend non-natives. Seed specifications vary by rainfall amount and soil conditions and should not be a one-size-fits-all prescription. Suggest the manual recommend a landscape architect or horticulturist with expertise in local conditions, specify native seed mixes, instead of including these tables.

*COMMENT NOTED: See response to 10.11. It is recommended that this BMP be revised to include various seed mixtures, including native seed mixes, as recommended by NRCS and other local experts. Language also needs to be added to emphasize the need to consult local experts to ensure that revegetation efforts are based upon appropriate agronomic practices and take into account site specific conditions such as soils, climate, critical slopes, etc.*

**17. Associated General Contractors (August 25)**

- d. There is no "erosivity waiver" as allowed under the Environmental Protection Agency's Storm Water Phase II Final Rule (January 2001).

Discussion of Erosivity Waiver: There is no "erosivity waiver" included in the SMMEW as allowed under the Environmental Protection Agency's Storm Water Phase II Final Rule (January 2001). The Revised Universal Soil Loss Equation is a long standing tool for the development community to determine those sites with little or no likelihood of either erosion problems or impact to the waters of the state. This is especially necessary for sites that are remote from existing surface and ground water. The EPA Construction Rainfall Erosivity Waiver (January 2001) should be included in the SMMEW.

*RESPONSE: See response to comments 10.11 and 15.d.*

- f. The State Building Code Council Erosion Control and Spill Prevention Guidelines are much more clearly articulated than the equivalent BMP's described in Chapter 7 of the Stormwater Manual and should be allowed in the Manual as an equivalent code.

Discussion of State Building Code Council Erosion Control and Spill

Prevention Guidelines: The State Building Code Council Erosion Control and Spill Prevention Guidelines (Guidelines) are much more clearly articulated than the equivalent BMP's described in Chapter 7 of the Stormwater Manual and should allowed in the Manual as an equivalent code. The Guidelines were developed by the Council over a two year period with extensive participation from industry groups, the environmental community, local governments and State agencies. In addition, the Guidelines are equivalent to Erosion Control and Spill Prevention specifications in the Washington State Department of Transportation (WSDOT) Highway Runoff Manual. This means that jurisdictions that adopt the Guidelines will be consistent with WSDOT specification, which should help streamline review and approval of both public and private road and highway projects. The Guidelines should either be incorporated into Chapter 7 of the SMMEW, or adopted as equivalent to the appropriate BMPs in Chapter 7. A copy of the Guidelines are attached.

*(Note: no attachment was provided with the comments received.)*

*RESPONSE: See response to comment 13.g.*

**18. Spokane County (August 25)**

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- a. Section 1.3.3, Construction Stormwater General Permit, Page 1-13, first paragraph: The end of the first sentence should be revised to include the word “public” when describing the ‘storm drain’ used to convey stormwater.  
*RESPONSE: Per comment 10.g this sentence will be revised to include “storm drain that flows to surface waters”. This would apply to all public and private storm drains that discharge to surface waters.*
- k. Section 2.2.2, Core Element No. 2, Page 2-11, first paragraph: To incorporate seasonally appropriate Construction SWPPP information really means that the SWPPP must cover all seasonal possibilities as plan expiration (at Spokane County) varies from two to three years, depending upon vesting. Thus, the project could begin in the spring, summer, fall or winter. The suggestion to “anticipate adjustments” in “the event of delays” would not be enforceable; once the plans are accepted for construction, we are not typically involved again until project completion (i.e. final walk-through). What is reasonable? Address all possibilities? Or leave as worded and attempt to have plan changes adopted if project is delayed?  
*RESPONSE: Good comment. Our interpretation of this language is to include contingency plans in the SWPPP for various scheduling scenarios including unforeseen delays, such as site stabilization during winter shut-down. We do not think it would be appropriate to address all the possibilities up front, only the ones that can be reasonably anticipated using professional judgment. Keep in mind that the SWPPP is intended be a living document, subject to revision during the life of the project. It would probably add clarity and be more consistent with applicable NPDES requirements to replace “If deemed appropriate, Construction SWPPPs may be revised during the construction phase of the project” with to be more consistent with the language in the new EPA Construction General Permit, page 11 – 3.11:*
- 3.11 Maintaining an Updated Plan**
- A. The SWPPP, including the site map, must be amended whenever there is a change in design, construction, operation, or maintenance at the construction site that has or could have a significant effect on the discharge of pollutants to the waters of the United States that has not been previously addressed in the SWPPP.
- B. The SWPPP must be amended if during inspections or investigations by site staff, or by local, state, tribal or federal officials, it is determined that the discharges the SWPPP is ineffective in eliminating or significantly minimizing pollutants in storm water discharges from the construction site.
- C. Based on the results of an inspection, the SWPPP must be modified as necessary to include additional or modified BMPs designed to correct problems identified. Revisions to the SWPPP must be completed within seven (7) calendar days following the inspection. Implementation of these additional or modified BMPs must be accomplished as described in Subpart 3.6.B.
- nnn. No Comments on Chapter 7.  
*COMMENT NOTED: Thank you.*

**Chapter 8**

**2. Public workshops (June 23-26)**

- o. Please check section 8.3 where the text seems to infer “regulations-type” requirements.  
*COMMENT NOTED: This section was reviewed and the text seems*



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*appropriate for identifying the technical requirements for complying with the regulations that apply not only to stormwater management but also to handling and disposal of waste materials. If an owner-operator is not following the specifications of the Manual, s/he is not violating the Manual: s/he is violating a permit or a state or federal regulation.*

**10. Yakima County (August 20)**

- nn. Chapter 8 – Source Control, Section 8.1.2, page 8-1 – Need to bold “Section 8.1, 8.2, etc.” to distinguish the four sections. Also need to consider the numbering and grouping of the four sections as follows:

Section 8.1 – Introduction

Section 8.2 – Stormwater Pollutants and Adverse Impacts

Section 8.3 – Operational BMPs

Section 8.4 – Structural BMPs

*RESPONSE: Will either make bullets or separate paragraphs.*

- oo. Table on page 8-5, not numbered, page 8-5 – Is there a note “F”? There is an “(F)” in the table. Or is this supposed to be an “E”?

*RESPONSE: This table needs editing for clarity. E does not apply as indicated, and F should be E as suggested in the comment.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- cc. Appendix 8A: A Table of Contents for SIC’s would be helpful.

*RESPONSE: Will include a TOC for the SICs.*

**16. WSDOT (August 25)**

- q<sup>7</sup>. Page 8-17, Applicable BMP’s for Streets and Highways. The first bullet should be eliminated. The second bullet is appropriate. Add the last sentence of the first bullet to the second bullet.

*COMMENT NOTED: The first bullet provides appropriate common-sense guidance, as information continues to become available regarding available chemicals and other materials.*

**NEW COMMENT:** Correct typo in bullet referenced above. Should be de-icers.

**18. Spokane County (August 25)**

- ooo. No Comments on Chapter 8

*COMMENT NOTED: Thank you.*

**19. Auto Recyclers of Washington (September 2 – late comments)**

- a. In Section 8.3.2 for vehicle recyclers, we see that you have reference the BMP Guidance Document #94-146 for vehicle recycling facilities. We commend you for referencing this document and support its inclusion in the Final Manual as this BMP Guidance Document was carefully developed with the Department of Ecology to maximize stormwater water quality while making it workable for the auto recycling industry. Comment: We support the referencing and reliance on this BMP Guidance Document for stormwater facilities in eastern Washington.

*COMMENT NOTED: Thank you.*

### **Glossary**

**4. Department of Ecology (July 30)**

- b. Correct the redevelopment definition in the glossary (remove 35% threshold), p.Glo-21.

*RESPONSE: Will make the change. See also 9.q.*

**9. City of Spokane (August 20)**

- o. Page GLO-20 Predeveloped Condition - we disagree with the definition for predeveloped as prior to the influence of Euro-American settlement. In many cases, the surrounding areas have changed significantly where that interpretation no longer fits. In others, we don't know what those original conditions were. Let's move to a definition supported by available information.

*RESPONSE: See 11.d and g under Chapters 1 and 2. Will expand definition to address that there is limited information for many parts of eastern Washington.*

- p. Page GLO-20 under Rational Method, delete last sentence.

*RESPONSE: On page 4-27 drywells and conveyance are also referenced. Will change this sentence in the glossary to add those applications for consistency.*

- q. Page GLO-21 under Redevelopment, eliminate reference to 35% since this is no longer in Section 2.1.2

*RESPONSE: Agreed. See 4.b.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- e. Section 2.1.2, page 2-4 second bullet: The use of the term "basic treatment" occurs for the first time in the manual in this paragraph. A definition for this term should be included in the glossary and/or there should be reference to the location in the manual where it is further defined.

*RESPONSE: Will add definition of basic treatment to Glossary.*

- i. Section 2.2.5, page 2-19: Include a definition for moderate use sites in the glossary like provided for high use sites.

*RESPONSE: Will add definition of moderate-use sites to Glossary.*

### **Cost Analysis**

*(note that the final Cost Analysis will not be published as part of the Manual;  
instead it will be posted on Ecology's website)*

**4. Department of Ecology (July 30)**

- u. Incorporate changes to Cost Analysis based on discussions and comments received in late June 2003. The subcommittee may choose to further discuss this section when reviewing comments received on the final draft Manual.

*RESPONSE: Consultant will make recommended changes. The subcommittee noted that there are errors in Table 12, and that Construction ESC costs did not appear to be included. The subcommittee has 2 weeks from today to review this section and email additional comments and suggested changes to Dave Moss and Karen Dinicola. After the changes are made, the Cost Analysis section will be posted on Ecology's website and not published in the Manual.*

**25. Summary of proposed changes to Cost Analysis (10/9/03)**

- a. The cost estimates for Wenatchee include metals treatment and flow control. If the site is located on a small creek, then these facilities would be required. However, if the site discharged to the Wenatchee or Columbia Rivers (likely in

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Wenatchee) then neither metals treatment nor flow control would be required. The cost estimate should note this caveat.

*RESPONSE: We will make a change for these Wenatchee examples and say that the sites are presumed to lie in areas with direct discharge to the river, and therefore metals removal and flow control will be removed from the cost estimates as applicable. Oil control still required in such locations in both the pre- and post-manual 8-acre commercial scenarios, with the cost analysis still demonstrating that the pre-manual assumption of oil/water separator vaults for the commercial example results in much greater costs vs bioinfiltration swale for oil control and conventional treatment post-manual.*

- b. Regarding City of Kennewick not requiring treatment prior to infiltration under the new manual (Karen noted that this looked suspect in Table 1) -- Here is what Rob Harrison of our office received when he checked with Steve Plummer on May 20th. "The lowdown - for the most part, infiltration rates vary, but on the average, are fairly high. They typically use only drywells for stormwater treatment and disposal. With really deep water tables, they are finding that they obtain all the treatment they could ever need through straight infiltration - although, at high-use sites, they would use submerged outlets in catchbasins. At fueling facilities they would also use o/w separators. However, for both of our scenarios, the formula that he would expect to see is the same - 4 drywells (Kennewick Std. Detail on p 5-38 of draft manual) per acre of impervious. They make no distinction between NPGS and pollution-generating surfaces because they consider the infiltrating soils to provide treatment if needed."

*RESPONSE: What will happen in Kennewick when the manual is completed? From what I know their soils do not meet the manual's criteria for effective treatment properties, yet they content the aquifer is so far below the ground surface that pretreatment is unnecessary. Will they be successful in arguing that business as usual is sufficient, or will Ecology require that pretreatment be provided before discharge to groundwater? It is a relatively simple matter for us to add pretreatment costs into the "post-manual" estimates, but we seem to be caught in a political situation here.*

- c. Regarding Spokane's current design storm standard (listed in Table 2): Karen commented "Is this *really* what Spokane requires now? I was under the impression that Type II was in use, not Type IA. In any case, discharges to the Spokane River are probably not held to this standard (and are exempt by the manual)."

*RESPONSE: Either we erroneously used Type 1A when we should have used Type II, or (more likely) Type 1A was incorrectly listed in Table 2. Either way, it will be fixed. FYI, Steve Hansen from City of Spokane said that 95% of the city overlies the aquifer, requiring treatment prior to infiltration. Exceptions to that norm include drainage collected from city streets and discharged to the river in those areas, but our Spokane development examples don't seem to fit that exception. So we assumed the more common scenario of onsite flow disposal via infiltration.*

- d. Other comments in notes at bottom of Table 2.... need to clarify the following:

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i. If flow control were required by the manual, the requirement would be to release the entire post-developed 2-year volume at 50% of the pre-developed 2-year peak flow rate. We will add this note in the final report version of this table.

*RESPONSE: What (city/scenario) this is referring to?*

ii. The manual allows local jurisdictions to set the upper flow rate. It is inappropriate to presume that Pullman would not continue to use the 10-year flow rate.

*RESPONSE: Agreed - we will make this change in the final report, and in the process will probably re-calculate the slightly lesser detention storage needed for both the 2- and 8-acre "post-manual" scenarios. The cost effect will be very minor.*

e. The title of Table 3 will be edited to remove Kennewick

f. The type of 8-acre commercial development envisioned in the cost analysis report is something like a big box retail store (Home Depot, Wal Mart, whatever), a strip mall, or supermarket. We will clearly state that in the final version of the report. If a surface discharge scenario, lot of vehicles in the parking lot triggers the manual's oil control requirements, and potentially the metals treatment requirements as well.

g. Finally, The other comments that were made during the last meeting included a general comment that Table 12 contained a lot of errors and that Construction ESC costs were not included (although there are also numerous local requirements for that now -- particularly to protect from wind erosion).

*RESPONSE: What are the errors in Table 12? The scope of this cost analysis effort was on post-construction BMPs. We did not address construction-phase costs all along and cannot do so now.*

**26. City of Wenatchee comments on Cost Analysis (10/12/03)**

The City of Wenatchee recommends that the following revisions be made to the cost estimates in order to reflect actual conditions a little more accurately. But first a general note. It should be specified whether these estimates are made assuming a public works contract or private work. The reason I bring this up is the way the estimates are presented, it looks like they are public work. For example, private work typically sees design and construction engineering costs down around 15%. In addition, prices for labor intensive line items in private work are typically much lower than for public.

a. Table 12: Wenatchee Urban Area 2-acre residential site pre NPDES regulations. Considerations:

- i. The current regulations for each of the four jurisdictions in the Wenatchee Urban Area differ.
- ii. Under the pre NPDES regulations, water quality treatment for a 2 acre residential site is not required.
- iii. All but a few select locations in the Wenatchee Urban Area drain to the Columbia or Wenatchee rivers. Therefore, flow control is not required to protect the Wenatchee and Columbia Rivers. In some locations, flow control is required due to the lack of a conveyance system, but not for stream protection.

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- iv. There are no engineering and permitting fees for stormwater.  
In order to compare apples to apples, the cost estimate for this condition should assume a storm sewer conveyance system is available for discharge (as is the case for 90% of the City of Wenatchee) and water quality is not required. The storm sewer system cost under these conditions is zero other than for the construction of the conveyance system which is required for pre and post NPDES regulations.
- b. Table 13: Wenatchee Urban Area 2-acre residential site post NPDES regulations. Considerations:
  - i. The regulations for each of the four jurisdictions in the Wenatchee Urban Area will be roughly the same in terms of water quality requirements.
  - ii. Water quality treatment for the site will be required.
  - iii. As in the pre NPDES condition, flow control will not be required since the Columbia and Wenatchee Rivers are listed as exempt water bodies. Therefore, the flow control portion of this estimate can be removed.
  - iv. The cost estimate provided in Table 13 does not include structures to get the water from the swale into the conveyance system. Piping and Structures would be an additional cost to the conveyance system to facilitate use of a water quality facility. For example, a 2 acre site will likely require the installation of 1 additional 48" Type 2 catch basin (\$2,000) and potentially 120' of 12" storm sewer (\$1,800) (assuming one lot depth).
- c. The subtotal for this cost estimate is grossly under estimated based on unit costs because of the relative amount of work being performed. For example, seeding and mulching is required for the swale, but no where else in the subdivision. The estimate for seeding and mulching is \$48. In reality, it would cost at least \$500 to even entertain the work. The same is true for quarry spalls, and soil amendments. Excavation may be reasonable since there will be other similar work performed. Unit pricing is fine, but it should be checked against ball park figures. Looking at a 2 acre subdivision, with a bioswale for water quality, a person might expect to pay \$15,000 for the construction of the water quality facility.
- d. I realize land value is not included in the estimates. However, it is really the most important consideration in the Wenatchee Area and it should be noted as an assumption at the bottom of the estimate. Typical subdivision in Wenatchee result in minimum lot sizes. Therefore, it is likely that 2 acre subdivision would lose the value of one lot to accommodate stormwater facilities (\$40,000 - \$60,000 depending on location).
- e. There will likely be engineering and permitting fees for stormwater, but they are not known at this time.
- f. Table 14: Wenatchee Urban Area 8-acre commercial site pre NPDES regulations. Considerations:
  - i. The current regulations for each of the four jurisdictions in the Wenatchee Urban Area differ.

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- ii. Under the pre NPDES regulations, water quality treatment for an 8 acre residential site is not required in the City of Wenatchee; however, it is required in the other 3 jurisdictions.
- iii. Water quality treatment requirements have not been detailed to the development community. Therefore, treatment systems are often very minimal. For this example, I would recommend that the pre NPDES cost be estimated using 4 WSDOT Catch Basin Type 2 with flow restrictor – oil separator (Standard Plan B-3). These facilities typically cost about \$3,500 installed and about \$2,500 for materials and fabrication. All of the other line items can either be eliminated or substantially reduced with the \$3,500 each price.
- iv. There are no engineering and permitting fees for stormwater.
- g. Table 15: Wenatchee Urban Area 8-acre commercial site post NPDES regulations. Considerations:
  - i. The current regulations for each of the four jurisdictions in the Wenatchee Urban Area will be the same.
  - ii. This cost estimate looks reasonable. No changes suggested
  - iii. There will likely be engineering and permitting fees for stormwater but they are not known at this time.

*RESPONSE: All of these comments will be considered by the consultant in revising and finalizing the Cost Analysis.*

**WSDOT set-aside comments**

*(the comments below are to be addressed in revising the Highway Runoff Manual, but not in the first printing of the Stormwater Management Manual for Eastern Washington)*

**16. WSDOT**

- o. Page 2-2. The definition for *new development* is different than define Ecology's Stormwater Management Manual for Western Washington (SMMWW). Should use the same definitions for both sides of the state to avoid confusion. A flow chart would be useful to show the different steps between *new development* and *redevelopment*.  
*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. It is likely that WSDOT may either choose the more restrictive of the two definitions or accept the split.*
- p. Page 2-2, Section 2.1.1, last paragraph. This paragraph talks about adding a lane. What about realignment? By enlarging the radius of a curve, if the pavement width is the same, the total impervious area is reduced. Is this new pavement, replaced pavement, or do we get to subtract the obliterated pavement if we remove, restore the infiltration capacity, and revegetate?  
*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. WSDOT should propose specific design criteria for the project described in the contract.*
- v. Page 2-8, Local Exceptions/Variations. How does this apply to WSDOT. Can WSDOT give itself variations if they follow the three bullets? What are our public notice requirements?

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*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM.*

- tt. Page 2-31, 2nd to last paragraph on additional exemptions. Should not restrict additional exemptions simply as a function of natural vegetative cover. Allowances should be made to apply this methodology to the vast areas of agriculturally zoned land in eastern Washington. Dispersion cannot be done as outlined in the BMPs unless one controls the land, however tort law already exists to protect down gradient property so it should not matter who controls the land. WSDOT suggests using the five percent manmade impervious (or better yet 10 percent) as the only criteria. If the impervious area is minimal then dispersion would work, however in a highway setting it is impractical to reserve 90 percent of the road right-of-way for vegetation. A more pragmatic solution is to allow dispersion (which with proper infiltration, requires no additional quantity treatment) if manmade impervious area is less the ten percent of the contributing basin at the ultimate surface discharge point. This approach would foster greater use of dispersion and infiltration as the preferred approach rather than promoting the collection and then conveyance of discharges.

*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. WSDOT should propose an appropriate approach and requirements for using private agricultural land for dispersion and may need to select a location for demonstrating the that the approach is equivalent to dispersion in areas of native vegetation. If the method is approved by Ecology for the HRM then it will also be adopted in the SWMMEW through an amendment process. See also comment b<sup>7</sup> below.*

- y<sup>6</sup>. Page 6-51, BMP F6.41, Applications and Limitations. Add roads to the list of applications.

*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. Ecology's LID committee is working to develop appropriate methodology for applying this BMP to roads and also considering the extent to which the approach can qualify as a treatment technology. If the method is approved by Ecology for the HRM then it will also be adopted in the SWMMEW through an amendment process.*

- b<sup>7</sup>. Page 6-53, BMP F6.42, Design Guidelines. The design guidance is written for "residential development". How do the guidelines apply to public roads and highways? Preserving only 10 percent of the right-of-way for road use is impractical. Percentages are from western Washington. Are they appropriate for in eastern Washington?

*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. As written, this BMP was not intended to apply to roads: it is intended for residential and commercial developments. WSDOT needs to propose appropriate design criteria for roads projects. See also comment tt above.*

*WSDOT also submitted extensive comments on methodology for determining infiltration rates, included below. Ecology believes that many of these ideas have merit, but they are presented at an awkward time that does not allow for appropriate review and thorough consideration needed prior to inclusion in the*

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*SWMMEW. Some of the comments were addressed by the Eastern Washington Stormwater Manual Subcommittee together with the other public comments received on Chapters 5 and 6. The comments below will be remanded to the HRM revision process. Methodologies approved for the HRM may be added to the SWMMEW through an amendment process.*

Additional specific comments on infiltration:

v<sup>7</sup> See the discussion below about infiltration rates:

Table 5.4.1: There is a misunderstanding in both the Western Washington manual and the final draft Eastern Washington manual regarding the nature of the infiltration rates presented in the table. The infiltration rate is actually equal to the soil hydraulic conductivity multiplied by the hydraulic gradient. Both manuals short-cut the infiltration rate calculation by empirically relating the soil classification or gradation to the observed “long-term” infiltration rates measured in full scale facilities, or the infiltration rates presumed to be occurring in full scale facilities based on experiential judgments. This empirical approach unfortunately “hardwires” the infiltration rates to the conditions that predominated the case histories used in the empirical analysis. The long-term rates provided in the Western Washington manual were for ponds that were relatively shallow and were at a location where the ground water table was relatively shallow (i.e., a water table depth of approximately 10 ft or less below the pond bottom).

We know that the hydraulic gradient is primarily a function of depth to ground water, the depth of water in the facility, the potential for ground water mounding, and to some extent facility geometry. If the water table is deep (say, 50 to 100 ft deep or more), the hydraulic gradient is determined by the depth of the advancing wetting front as the water seeps below the pond, and generally approaches a value of 1.0 once steady state conditions are reached (before steady state conditions are reached, the gradient can be much higher than this). If the water table is shallow, or if an impermeable layer is encountered at shallow depth below the pond, the gradient is controlled by ground water mounding below the pond, and the gradient is likely to be much less than 1.0 (i.e., one to two orders of magnitude less than 1.0). Therefore, if the short-term rates from the Western Washington manual are used for design, and the water table is shallow, the infiltration rates will be much too high. In this case, the long-term rates in the Western Washington Manual should be used, especially if there is some potential for long-term siltation and biofouling to occur, since the long-term rates provided in that manual are reduced due to both shallow water table effects and long-term siltation/bio-fouling. However, if the water table is deep, even the short-term rates provided in the table will be much too low.

It is a bit of a misnomer to call the rates provided in Table 5.4.1 short-term, since the empirical reduction factor in the Western Washington manual results in a long-term rate that addresses both shallow water table conditions and long-term siltation/bio-fouling. Those correction factors address part of the water table issue (i.e., related to the hydraulic gradient) and all of the siltation/bio-fouling issue. Therefore, the correction factors provided in the referenced table (i.e., Table 3.7 in the Western Washington manual) are not just



for correcting short-term values to long-term values. These “short-term” infiltration rates were obtained from the 1992 Ecology manual, and the 2001 Western Washington Manual simply attempted to correct those values to more accurately reflect the full-scale observations of ponds in Western Washington. Therefore, the short-term infiltration rates are only short-term for a specific depth to water table below the facility, and facility geometry.

A related misunderstanding is the nature of the “infiltration values obtained from an in-situ soil test (see Section 6.3.3 in the Eastern Washington manual) such as a double ring infiltrometer test, other soil permeability tests, pit infiltration tests, or bore hole percolation tests (i.e., slug tests, packer permeability tests, etc.). These tests provide a value for the soil hydraulic conductivity, which must be multiplied by the design hydraulic gradient to obtain an infiltration rate. For deep water table sites, the hydraulic conductivity will be approximately equal to the infiltration rate because the hydraulic gradient is approximately equal to 1.0. However, for shallow water table sites, these hydraulic conductivity values will not equal the infiltration rate, since the hydraulic gradient is far less than 1.0. The current draft of the Eastern Washington manual is misleading on this point.

It is important that designers recognize the nature of the infiltration rates and infiltration design guidance provided in the draft manual. I recommend that the following paragraphs be added to both Sections 5.4.3 and 6.3.3, and be referred to in Section 6.3.6 to clarify these issues: **“The infiltration rate is equal to the soil hydraulic conductivity multiplied by the hydraulic gradient. The presumptive rates provided in the table short-cut the infiltration rate calculation by empirically relating the soil classification or gradation to observed infiltration rates measured in full scale facilities, or the infiltration rates presumed to be occurring in full scale facilities based on experiential judgments. This empirical approach unfortunately “hardwires” the infiltration rates to the conditions that predominated the case histories used in the empirical analysis.**

The hydraulic gradient is primarily a function of depth to ground water, the depth of water in the facility, the potential for ground water mounding, and to some extent facility geometry. If the water table is deep (say, 50 to 100 ft deep or more), the hydraulic gradient is determined by the depth of the advancing wetting front as the water seeps below the pond, and generally approaches a value of 1.0 once steady state conditions are reached (before steady state conditions are reached, the gradient can be much higher than this). If the water table is shallow, or if an impermeable layer is encountered at shallow depth below the pond, the gradient is controlled by ground water mounding below the pond, and the gradient is likely to be much less than 1.0 (i.e., one to two orders of magnitude less than 1.0). Since the infiltration rate is directly proportional to the hydraulic gradient, these large differences in the hydraulic gradient will make a large difference in the infiltration rate at a given site.

Table 5.4.1 provides infiltration rates obtained from the “Stormwater Manual for Western Washington”, 2001, that are designated as “short-term”.

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The Western Washington Stormwater Manual (2001) provides correction factors to estimate the long-term infiltration rates from the short-term values reproduced in Table 5.4.1. The “short-term” infiltration rates were obtained from the 1992 Ecology stormwater manual, and specifically how these rates were developed (i.e., their empirical basis) is obscured in history. The 2001 Western Washington stormwater manual simply attempts to correct those values to more accurately reflect the measured full-scale observations of infiltration rates in ponds in Western Washington, so that the final design infiltration rate would more accurately reflect measured performance. The full-scale ponds used to derive these correction factors characteristically were located at sites where the ground water table was shallow (i.e., depth to groundwater was less than 10 ft in most cases). Furthermore, many of these ponds had significant biofouling and/or siltation that could reduce infiltration rates. Therefore, the long-term rates provided in the Western Washington Stormwater Manual (2001) are likely to be conservative for most infiltration situations.

The rates identified in the Western Washington 2001 manual as short-term are not really short-term per se. That is, the difference between the short-term and long-term values provided in the Western Washington manual is due to the reduction in infiltration rate resulting from bio-fouling/siltation (a long-term issue) and partially due to the difference in the hydraulic gradient assumed by the “short-term” values and the actual gradient in the case histories used to empirically determine the long-term infiltration rates (a relatively short-term issue). Therefore, the short-term infiltration rates provided in Table 5.4.1 are only short-term for a specific depth to water table below the facility, and facility geometry. If these short-term rates are used for design, and the water table is shallow, the infiltration rates will be much too high. However, if the water table is deep, even the short-term rates provided in the table will be much too low.

Field tests such as the double ring infiltrometer test, other soil permeability tests, pit infiltration tests, or bore hole percolation tests (i.e., slug tests, packer permeability tests, etc.) provide a value for the soil hydraulic conductivity, that must be multiplied by the design hydraulic gradient to obtain an infiltration rate. For deep water table sites, the hydraulic conductivity will be approximately equal to the infiltration rate because the hydraulic gradient is approximately equal to 1.0. However, for shallow water table sites, these hydraulic conductivity values will not equal the infiltration rate, since the hydraulic gradient is far less than 1.0. The designer must recognize this fact when attempting to directly use such test results for design.”

*COMMENT NOTED: This needs to be addressed by Ecology and WSDOT together in developing the revised HRM. WSDOT has proposed an approach that needs to proceed through an appropriate review and approval process. If the method is approved by Ecology for the HRM then it will also be adopted in the SWMMEW through an amendment process.*

<sup>w7</sup> The specific wording of the commentary provided in Comment #v<sup>7</sup> above will depend on how the short-term versus long-term infiltration rate issue (Comment #u<sup>7</sup>) is resolved. Attempting to use the short-term rates from the Western Washington manual to obtain infiltration rates that are more palatable for

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Eastern Washington use is a rather messy and convoluted way to deal with the conservative nature of the infiltration rates in the Western Washington 2001 manual. While taking that approach may get one closer to numbers more appropriate based on experience in Eastern Washington, doing so greatly confuses the issue (see Comment #v<sup>7</sup>), and could cause confusion for many years to come. It would be much better to recommend long-term rates, and provide more detailed explanation as to why those values are so conservative and for many cases may not be applicable to Eastern Washington, and then explain what to do adjust those values for Eastern Washington conditions, rather than plucking values out of the Western Washington manual that were not intended to be used the way it appears to be proposed in the Eastern Washington manual.

*COMMENT NOTED: Will address with comment v<sup>7</sup> above.*

**Policy-related comments**

*These comments address the scope and purpose of the manual, regulatory issues, the question of whether the manual is a rule, the presumptive versus demonstrative approaches to protecting water quality, application of permit requirements, and so on. None of these comments results in a change to the content of the Manual; a few related changes are detailed in the responses to specific comments on chapters in the Manual.*

**2. Public workshops (June 23-26)**

- d. Discuss projects that cross several local districts.

*RESPONSE: Addressed per recommendation of comment 16.ww as follows: “Jurisdictions may have interconnected storm sewer systems. Neighboring jurisdictions are encouraged to work together to establish consistent design criteria for stormwater facilities since the climatic, geologic and hydrologic variation among neighboring jurisdictions is likely to be minimal. Where municipal separate storm sewer systems are interconnected between jurisdictions with different requirements, the downstream jurisdiction’s requirements apply.” Ecology believes that the potential to improve consistency between jurisdictions on how stormwater is managed is one of the benefits of the development of the Stormwater Management Manual for Eastern Washington.*

- e. Maybe more informational meetings will help the local people in the county and cities.

*RESPONSE: Once the Manual is finalized, Ecology and the steering committee plan to offer workshops at more locations around eastern Washington.*

- f. Please clarify if certain steps and BMPs are actually required or just suggested.

*A certain amount of record keeping/accounting/assessment activities will be easier to quantify/qualify if we know for sure what is “absolutely” required.*

*RESPONSE: All of the BMPs are provided for project proponents to choose from. Certain industrial or other land uses may have more specific BMPs identified for them. Unless a specific BMP is required by a jurisdiction or for the land use, it is for the project proponent to decide how to achieve the goal of a Core Element, which is a required step only if (1) you are required by a*

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*permit or other authority to follow the Manual, and (2) your project meets the thresholds described therein.*

- g. Method or procedure to modify the manual so it will be a dynamic, living guidance manual – suggest using an Administrative Adjustment process of some kind.

*RESPONSE: Ecology plans to follow the same procedures for updating the Manual as are in place for the manual for western Washington (electronic errata sheet, addenda, and long-term review and revision).*

- j. Retrofits may be needed for some receiving waters that are degraded.

*RESPONSE: Yes, retrofit priorities and actions will need to be identified by local governments or through a TMDL or other water cleanup plan. The Manual was written to provide guidance on proper stormwater management for new development and re-development. It was not developed nor intended to provide guidance or standards for stand-alone stormwater retrofits. The Manual may be helpful in identifying and implementing such actions but it is not intended to serve as a retrofit guidance.*

- k. Cattle ranchers are being asked/required to do more than jurisdictions are, regarding prohibitions for discharges to receiving waters.

*RESPONSE: We disagree. The programmatic activities envisioned for a comprehensive municipal stormwater management program, combined with on-site stormwater controls, are intended to help local jurisdictions implement and enforce the same requirements regarding prohibitions of discharges of pollutants to receiving waters. The requirements are different, but not necessarily of a lesser magnitude. See also comments 12.c and d.*

- o. Please check section 8.3 where the text seems to infer “regulations-type” requirements.

*RESPONSE: This section was reviewed and the text seems appropriate for identifying the technical requirements for complying with the regulations that apply not only to stormwater management but also to handling and disposal of waste materials. If an owner-operator is not following the specifications of the manual, s/he is not violating the manual; s/he is violating a permit or a state or federal regulation.*

**6. Pierce County (August 18)**

- b. Regarding the presumptive/demonstrative approach, if a local government adopts the “demonstrative” approach (i.e., an alternative manual), will Ecology apply its oversight responsibility for Phase II communities at a programmatic level (i.e., review and approve an alternative manual) or will Ecology make determinations of MEP and AKART on a project by project basis?

*RESPONSE: Ecology has not determined its approach or requirements for Phase II jurisdictions. It is unlikely that the Department will have sufficient resources to review and approve every Manual adopted by a regulated entity, in which case those jurisdictions will need to assume responsibility for ensuring that their manuals are equivalent to this Manual in establishing technological and operational requirements for projects that comply with all applicable Federal and State regulations. Ecology will not review individual projects*

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*located in Phase I and II jurisdictions unless we have direct permitting  
authority (such as an industrial stormwater permit).*

**8. Ten Cities (August 19)**

- a. I have one final comment on some language added to the Stormwater Management Manual for Eastern Washington in the late stages when the subcommittee was working through the comments on the draft. The comment goes to how the Department of Ecology (Ecology) is interpreting the WACs and RCWs in regards to compliance with water quality standards. It may be appropriate to get legal counsels opinion regarding the potential liability associated with the general NPDES permit that will be issued under the MS4 program.

On page 1-2 (Section 1.1.1) the text discusses how the Manual can be viewed as a technical guide that “...implemented correctly, [they] should result in compliance with existing regulatory requirements for stormwater – including compliance with the Federal Clean Water Act, Federal Safe Drinking Water Act, and State Water Pollution Control Act.” The following paragraph describes how the Manual, or following the guidelines therein, provide all known and reasonable treatment (AKART; RCW 90.53.040 and RCW 90.48.010) required to meet State water quality guidelines. When Ecology issues a general NPDES permit for municipalities, it assumed that AKART will play a major role in determining compliance rather than water quality monitoring.

This is all well and good until you reach the 3rd paragraph of this section. In this section Ecology seems to backtrack in the assertion that implementation of the practices in the Manual will provide any assurance at all that the municipality will comply with water quality standards. The text states that following the guidance of the Manual does not excuse the municipalities from additional obligations to improve the water quality of their discharges if they do not meet State Water Quality Standards (WAC 173-201A and WAC 173-204 primarily). These groundwater and surface water standards are getting stricter all the time and may lead to difficulties in compliance. A specific example I can relate has to do with the temperature of discharges to surface water. In Oregon, they are now interpreting the “no anthropogenic warming” clause to apply across the board regardless of stream temperature or season of the year. The impact to municipalities would be that they would have to show their discharges are cooler than the receiving water temperature (this is rarely the case in either summer or winter) or that there is a sufficient mixing zone to mitigate impacts. This may prove difficult to do given the tendency of migrating salmonids to follow the shoreline. Stormwater discharge may be viewed as temperature barriers to migrating salmonids in the future. Discharge may have to be moved to a more central part of the receiving water or taken to groundwater to insure compliance with water quality standards.

Since the guidelines recommended in the Manual are based on statistical and limited control of water pollution, all municipalities will be out of compliance with water quality standards during recurring storm events. The design standards recommended in the Manual are based on a certain storm event that

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statistically occurs once in every 10 or 25 years. When storm events exceed the design rainfall amount, the facilities designed to capture and remove pollutants from the discharge will fail and water quality standards will be violated. Even if Ecology does not interpret stormwater discharges as impacting water quality, part of the liability that the Municipalities incur as part of the NPDES permit program is that it opens them up to 3rd party lawsuits when it can be shown that they are not in compliance with water quality standards.

I recommend that Ecology remove the 3rd paragraph from this section or develop the general NPDES permit in such a way that municipalities are excused from meeting water quality standards when the storm events exceeds the design recurrence interval.

*RESPONSE: We believe that, in most cases, application of the on-site technical requirements of the Manual and programmatic requirements of the Model Program on a cumulative scale will result in protection of local water quality from adverse impacts of stormwater discharges in eastern Washington.*

*Ecology recognizes there maybe some cases where the stormwater management practices outlined in the Manual maybe over protective of water quality, we also recognize that there may be cases where the practices in the Manual will not be sufficient to protect water quality. Where site specific information indicates the practices in the Manual are not sufficient to protect water quality, other actions may be necessary.*

*Oregon's water quality standard for temperature does not apply to eastern Washington jurisdictions. It is possible that Washington State's Water Quality Standards may change over time. Washington State's Water Quality Standards are adopted as state Regulations and follow the procedures for rule adoption established in the State Administrative Procedures Act. The presence or absence of this Manual does not change the fact that local governments and project proponents are obligated to properly manage their stormwater runoff in a way that complies with state law, including state Water Quality Standards. This Manual is intended to provide local governments, and project proponents with guidance on how to properly manage urban stormwater runoff so as to comply with State Water Quality Standards.*

*We disagree with the statement that all municipalities will be out of compliance with water quality standards during recurring storm events, since the criteria are ambient criteria and not discharge limits (generally expressed as a magnitude not to be exceeded for some duration with some reoccurrence frequency: for example the copper the acute criterion is expressed as value not to be exceeded for more than one hour once every three years). The design standards for water quality facilities are based on the 6-month or 2-year storm, not the 10- or 25-year storm because these smaller events, taken together, produce the majority of the annual runoff volume and because we acknowledge that it would be impracticable to treat 100% of the annual runoff volume from most sites. The Manual has a stated goal of providing treatment for at least 90% of the annual runoff volume and capturing the majority of the first flush events that occur in eastern Washington.*

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*The 3<sup>rd</sup> paragraph of Section 1.1.1 of the Manual accurately reflects current state law. The presence or absence of this Manual including the third paragraph is Section 1.1.1 does not modify these current regulatory requirements which exist whether or not it is included in the document. The requirements and conditions of the Phase II municipal stormwater permit for eastern Washington have not yet been determined.*

**10. Yakima County (August 20)**

- a. General Comment: Yakima County would like to be on the record that our understanding of the manual is to serve as a technical guidance document for implementation of stormwater management as required by NPDES Phase II. No jurisdiction in Eastern Washington is covered under Phase I. If Ecology's intent is to make this a rule or expects local jurisdiction to adopt it as a regulation, then the rulemaking process should be followed under Washington State statutes.

*COMMENT NOTED.*

- b. General Comment: The manual was developed through collaborative efforts from many private and public organizations, developers, citizens, environmentalists and many others. It is an excellent reference material and technical guidance document. It was mostly created by consensus and as expected not one group will like all of what was written. I feel that the manual subcommittee has done an outstanding job developing a manual that is at least 80 percent of a perfect manual. As an active participant, I think we have exceeded that goal and every one in the subcommittee should be commended for their hard work, dedication and many hours of work – preparing for the meeting, reviewing the draft documents and reports, discussing alternatives, and attending meetings. There are however some major issues that still need to be discussed such as the Underground Injection Control (UIC), use of vadose zone as treatment, and use of effective Best Management Practices (BMPs) like high efficiency sweeping as treatment. I feel that when those issues were discussed in the subcommittee, Ecology had already made up their mind and the results were not obtained by consensus of the group. This resulted in heated arguments and animosity between Ecology and several members of the subcommittee. Was Ecology even listening to the concerns?

*COMMENT NOTED: In instances where there is disagreement among participants at meetings, it has been Ecology staff's role and responsibility to provide a path forward. Regardless of positions on individual issues, Ecology appreciates the participation and input of each person and organization who has dedicated the time and resources to this effort. That does not mean that each person and organization will see exactly the results they desire, particularly when the range of perspectives on a topic is as broad as this subcommittee and the UIC rule revision advisory committee have experienced. Ecology acknowledges that in the first of the two instances noted above, Yakima County's input was not utilized as County staff would have preferred; however that does not mean that the input was not considered and taken into account when drafting the revised guidance. In the second noted instance, the information necessary to support the inclusion of high efficiency street sweeping*

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*as a stormwater treatment best management practice was not provided the subcommittee's consideration.*

- f. Section 1.3.1, page 1-12, 3<sup>rd</sup> paragraph – The statement suggests that local jurisdiction must apply the manual or an approved equivalent. We thought this is a guidance document and it's use is not a requirement, i.e., rule.

*RESPONSE: The role of the Phase II municipal stormwater permit and other permits referenced in Chapter 1.3 is to determine the requirements and compliance measures for permittees. The purpose of Chapter 1.3 is to highlight various regulatory programs that may require the use of the Manual per authority through existing rules. These regulatory programs exist regardless of the presence or absence of this Manual.*

*The basic requirement under the federal Phase II municipal stormwater regulations is that local governments properly manage stormwater discharges into and from their municipally owned and operated separate storm sewer systems. For example the Phase II stormwater rules require local governments develop a program for post-construction stormwater management in new development and redevelopment (40 CFR part 122.34(b)(5)). The Phase II municipal stormwater permit will require applicable local jurisdictions to comply with the federal Phase II rules. This Manual and the implementation of this Manual or parts of the Manual is intended to represent one way that local jurisdictions can satisfy the federal requirements (the presumptive approach). However, Ecology acknowledges that using the BMPS in the Manual is not the only way that stormwater can be effectively managed to protect water quality and satisfy the federal Phase II requirements. Local jurisdictions may choose to propose alternative stormwater management practices as a way of meeting the federal Phase II stormwater requirements, however if they do it will be their responsibility to demonstrate the alternative practices protect water quality and meet the federal Phase II requirements.*

- k. Section 1.4.3, page 1-18, 4th paragraph – The vadose zone issue has not been totally resolved. Using statements like “relying on the vadose zone to remove pollutants may result in contaminated soil...” appears to be speculative and biased against use of stormwater infiltration on projects. Out of many thousands of applications, there are extremely few documented instances where this statement is true. We once again see the “solid phase” of pollutants being related to state water quality standards (many of which were developed during toxicity tests using dissolved pollutants – even if the standard was then written as a total concentration). This is poor technical practice, and it indicates that the specific wording in the RCWs and WACs relating to water quality standards may need to be changed to properly relate to stormwater. We don't believe that Ecology should justify the technically incorrect regulation of solid phase metals composed of naturally occurring soil minerals, by saying that the groundwater or surface water standards were written for total metals. There should be some consideration of how the standards were developed and what the intent of a standard is. We don't believe that the State intends a total metal standard to apply to naturally occurring soil minerals contained in soils, sediments, and bedloads.



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*RESPONSE: The basis and requirements of the State's water quality standards is outside of the scope of developing the Manual. Dissolved data are presented where they are available, and comparisons were made only for data and standards that were expressed in the same fraction. The intent of the wording of the paragraph referenced in your comment is to show that there is a potential problem, shown in the body of literature available, which is avoidable by pre-treatment of discharges. This is a prudent and cautionary but not prescriptive statement, and it does not contradict encouraging the infiltration of stormwater where practicable.*

- m. Section 2.1.2, pages 2-2 through 2-5 – We have an issue on the thresholds used without much study done. Suggest review of the numbers by an independent science panel (ISP), especially if the Manual will be “required” by NPDES permits.

*RESPONSE: As was described in one the handouts at the public workshops held in June, the new thresholds found in the final draft Manual were based on the best professional judgment of the collective subcommittee following a search for and review of pertinent information. A scientific review of the Manual may be more valuable after it has been in use for a while and data have been collected to evaluate the practices therein. No independent technical or scientific review of the Manual is planned at this time.*

- n. Section 2.1.2, page 2-5, 2nd bullet. Suggest deleting or rewriting the requirement to retrofit stormwater treatment into existing drainage systems solely on the basis of the receiving water being listed as impaired under section 303(d) of the Clean Water Act. We are not aware of federal or state law requiring such actions in advance of TMDL development. Retrofitting can be extremely expensive because the existing drainage systems were initially designed (slopes, pipes, manholes, etc.) without a treatment system. Many treatment systems require land area and have hydraulic drops across them, which make it very difficult/expensive to retrofit into existing drainage systems (might have to tear out the old systems and rebuild an entire new drainage system to accommodate the new treatment facility). The bullet says that treatment system retrofitting is required if the receiving water is listed as impaired for “metals, oil & grease, coliform bacteria, sediment, suspended solids, phosphorus, or any other water quality problem that stormwater is considered a contributor”. We have concerns about this requirement. It short circuits the requirement of the Clean Water Act that Ecology prepare a clean-up plan (TMDL, Total Maximum Daily Load) that: (1) first verifies that the impairment listing is actually valid through additional sampling, (2) determines the sources/causes of the pollutant, (3) sets clean-up standards, (4) sets allowable amounts of pollutants (or concentrations) that can be discharged by significant contributors and still meet the water quality standards, (5) determines actions and monitoring required by contributors to attempt to meet the standards, and (6) requires adaptive management approaches where actions are assessed, progress towards compliance is assessed, and new strategies are developed if needed. Requiring retrofitting before such an analysis is done assumes that stormwater is a significant contributor, which may not be true.

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Spending scarce private and public dollars on the HOPE that the environment will be safeguarded is not acceptable to us. However, we would support rewriting the bullet to say that retrofitting may be required by local governments based on local knowledge about the causes of local water quality problems. Ultimately, we would rather that the State provide resources so that Ecology can fulfill their CWA obligation to prepare the clean-up plans. If stormwater is legitimately (scientifically) found to be a significant contributor of pollutants, we will perform the actions spelled out in the plan, including retrofitting.

*RESPONSE: The “trigger” in the Manual which would require all replaced pollution generating impervious surfaces meet Core Element #5 (Runoff Treatment) is a prudent approach and Ecology supports local governments taking an active role in requiring runoff treatment where they have local knowledge of the source/cause of water quality problems. However, the subcommittee has agreed to drop this bullet and rely only on requirements set forth in a water cleanup plan as indicated in the subsequent bullet with the precautionary statement that since stormwater is a known contributor of the listed pollutants, and local jurisdictions may have difficulty meeting TMDL waste load allocations if they wait until corrective actions are required by an approved TMDL.. See comment 11.g.*

- p. Section 2.2.5, page 2-16 to 2-17 – Same comment as number m, need to have a review by an ISP.

*RESPONSE: See 10.m above.*

- r. Chapter 3 – Preparation of Stormwater Plans: Section 3.2.1, page 3-2, last paragraph – Where will you send the downstream analysis report to? Ecology or local jurisdiction?

*RESPONSE: The assumption throughout the Manual is that review and approval is the responsibility of the permitting authority for a specific project, which can be a state or federal or local government agency. Generally, Ecology does not have a permitting or review role in individual projects located in Phase II jurisdictions. Local governments must determine an appropriate review and approval process for their jurisdictions.*

**11. Wenatchee, East Wenatchee, Chelan County, and Douglas County (August 21)**

- b. (1) Section 1.3.1, page 1-12: The last paragraph on page 1-12 is new to this draft of the manual with respect to Ecology issuing a combined permit. Discussion on a combined permit in the manual is premature since a permit has not been developed and we are currently working to address the legislature’s list of issues which will result in direction to ecology on this issue. Section 1.3 addresses some of the regulatory framework that provides the foundation for the NPDES and UIC programs and how this manual relates to them. However, many of the state regulations are missing from the manual. For example, there should be information provided on WACs 173-216, 173-226, 173-200, and 173-201A addressing state waste discharge permits, waste discharge general permit, water quality standards for ground water, and water quality standards for surface water respectively. We recommend that Section 1.3 be reorganized to present UIC information following discussion on the NPDES municipal permit, and that additional subsection covering the state regulations be added to this

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section.

*RESPONSE: The paragraph was inserted to provide clarity as to what the current situation is concerning Ecology's obligation under 90.48 to issue combined permits. The title of the section is unchanged from the first draft of the Manual. As you note, a report to the legislature is under development which may or may not result in a change in State law. All of the information contained in the Manual must be considered "correct at the time of publication." Chapter 1.3 is limited to discussing regulatory programs that provide separate permitting authority which may require use of the Manual for a given project. The state water quality standards (chapters 173-200, Ground Water Standards, and chapter 173-201A Surface Water Quality Standards) set standards for the state's water quality and are applicable to all waters of the state. Discharge permits or authorizations issued by Ecology under both federal law (NPDES permits, and 401 water quality certifications) and state law (chapter 90.48 RCW, State Water Pollution Control Act) must be consistent with the standards outlined in the states water quality standards. A discussion of the WACs describing the administrative procedures Ecology must follow in developing permits (Chapter 173-216 State Waste Discharge Permit Program, Chapter 173-218, Underground Injection Control Program, Chapter 173-220 NPDES permit Program, and Chapter 173-226 General Permit Program) is unlikely to add much to this Manual. The additional section you suggest might have been more appropriate to include in the final Model Program, although it might also be something we can develop and post on our website.*

(2) Relating to issuance of stormwater permits, we are concerned about additional costs to Eastern Washington communities to address groundwater discharges. The model program components and cost estimates address NPDES permit requirements associated only with discharges to surface waters in so far as the BMPs for minimum measures 3 through 6 are written only to address discharges to surface water. The model program is therefore incomplete if discharges to groundwater are to be addressed.

*RESPONSE: The Model Municipal Stormwater Program for Eastern Washington was not limited to the federal NPDES Phase II requirements and was written to reflect both state and federal requirements, including the need to address stormwater discharges into municipally owned dry wells. As a consequence the illicit discharge detection program included mapping municipally owned dry wells. Further, for both construction stormwater control (min requirement # 4) and post construction stormwater (min requirement #5) for private development tributary to municipal owned dry wells the model program would apply.*

*Requirements for local jurisdictions to address stormwater discharges to underground sources of drinking water exist with or without NPDES permits. Under the federal Safe Drinking Water Act, all owners of stormwater injection wells, including local governments are subject to the requirements of the underground injection control program. The two principal requirements of the federal UIC program are well registration and non-endangerment requirements (which will be further detailed in the state's revised UIC rule). The "minimum*

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*measures” simply provide a reasonable mechanism for complying with those requirements. Ecology believes that substantial economy can be achieved by addressing both surface and groundwater discharges together as part of a comprehensive stormwater program.*

- c. Section 1.3.3, page 1-13: The Construction Permit is directly tied to discharges to surface water. This is inconsistent with the Ecology proposed combined permit which also addresses groundwater. It is also inconsistent with Core Element #2 which requires a SWPPP for discharges to groundwater. These contradictions make it difficult for local agencies to require SWPPPs for discharges to groundwater.

*RESPONSE: We agree that this is awkward. This apparent inconsistency stems from Ecology’s policy to not require permit coverage for construction sites that discharge only to ground. Whether a discharge permit is required for a construction site is triggered based upon whether the site needs a permit under the federal NPDES permit program. However, once the permit is triggered, under state law the permit must address discharges to both surface and ground waters (waters of the state). To satisfy both state and federal law a combined NPDES and State Waste Discharge General Permit is issued. Local governments may still regulate individual projects within their jurisdictions through their own permitting authority.*

**12. Cheryl Morgan, Citizen (August 21)**

- a. I attended the Public Workshop held on June 24<sup>th</sup> in Clarkston, WA. During that meeting I expressed concerns in regards to the Final Draft. Because I am not sure if my comments at that meeting will be entered within the Final Draft, I wish to enter the following comments for Public Record. One of my questions was: “Under the Final Draft, will it be required for the owner/developer of a property to obtain a permit (similar to the permit required during development) from Ecology for the conveyance of stormwater from his/her property after development?” The answer was no. The Manual is not regulation. It is a guidance document to assist local governments for compliance with existing Federal and State water quality laws. It would stand to reason that the professional engineer who is endorsing the method of conveyance of stormwater from a site should be required to obtain a permit from Ecology, thus he or she would be made accountable and would be forced to look “out of the box” before approving an inadequate stormwater system that will not protect the water quality of our natural streams. After all, professional engineers are mandated by law to protect the natural resources of this state. It is of evidence many of the professional engineers have failed to honor their own code of ethics, thus the citizens of this state are being placed in an unsafe environment. Without a required permit there will be no continued accountability of enforcement for water quality protection from the owners of urban property by Ecology. Would it be possible to require the professional engineers of a project to obtain a stormwater conveyance permit from Ecology? If not, please explain.

*RESPONSE: Your comments at the public workshop in June 2003 were briefly captured in the summary of that meeting (see 2.j and k here and 2.l in the Chapter 1 comments). Ecology does not have the resources, and in some cases*

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*the authority, to review individual development projects. Typically the review and approval of individual development projects is and should be done by the local government. The State's authority to mandate local governments to do this is also limited.*

- c. It is of concern that the manual only applies to new development and redevelopment, meaning that retrofit to correct existing problems is not required. This is not the case for rural land owners, existing problems must be corrected. It is a well known fact that there are numerous un-identified and non-permitted pipes (direct source pollution) located within the City of Pullman that discharge directly into the SFPR or into tributary streams of the SFPR. Ecology has identified the SFPR as an impaired water body.

*RESPONSE: The Manual does not change or modify the responsibility to correct existing water quality problems. The scope of the Manual was limited to new development and re-development as a means to prevent additional water quality problems. The Manual did not address retrofits to address specific water quality problems due to the site specific nature of existing water quality problems and the site specific nature of their correction. Urban retrofit priorities and actions will need to be identified by local governments or through a TMDL or other water cleanup plan for a specific water body; those activities will be required. The Manual may be helpful in identifying and implementing such actions but it cannot by itself mandate retrofit activities. See also 12.d below.*

- d. It appears there are two sets of standards to protect water quality. Rural land owners must retrofit to correct existing problems while urban land owners will not be required to retrofit to correct existing problems, nor are the cities required to identify non-permitted pipes discharging into the natural waterways within this manual. The message Ecology is sending in this manual is that collectively (urban residents) can continue to pollute state waters, but individually (rural residents) can not pollute state waters. This would constitute selective enforcement and perhaps discrimination towards rural land owners.

*RESPONSE: Ecology disagrees that there are two standards for protecting water quality: all discharges, both rural and urban are responsible for protecting water quality. The Manual does not change this. What the Manual does provide is a set of commonly accepted practices for managing urban stormwater runoff to prevent additional water problems. The Manual does not change existing regulatory requirements to address existing water quality problems.*

- e. Because this Manual lacks regulatory mandates, there will continue to be a lack of enforcement by our local governments and Ecology for water quality protection.

*RESPONSE: As outlined in Chapter 1.3, there are a number of regulatory programs that already exist which provide the authority to mandate stormwater management in public and private projects. Retrofitting, or installation of stormwater treatment facilities in the absence of redevelopment, is either done at the local government's discretion, taking into account available resources and the anticipated benefit of the action, OR it is done to fulfill requirements of*

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*a completed TMDL or other water cleanup plan. The Manual may provide assistance in selecting BMPs once the need for retrofit is identified and/or mandated.*

**13. CPM Development Corporation (August 25)**

- a. The Stormwater Manual is a clearly a Significant Legislative Rule under RCW 34.05 the State Administrative Procedures Act (APA) and contains innumerable requirements for compliance. It is necessary for Ecology to take appropriate steps under APA.

*RESPONSE: As explained in Section 1.1 of the Manual, the Manual is not a regulation and has no inherent regulatory authority. The Manual is not a regulation, significant or otherwise. Under the State's Administrative Procedures Act, (chapter 34.05 RCW) a rule is defined as an agency order, directive, or regulation of general applicability (a) the violation of which subjects a person to a penalty or administrative sanction. The requirement to properly manage discharges of waste materials (including stormwater) to prevent pollution of state waters is a requirement of both federal and state law. Under both federal and state law, applicants for discharge permits are responsible for demonstrating that their proposed discharge will comply with the federal technology based treatment requirements, the state AKART requirement and state water quality standards adopted under the federal Clean Water Act. The publication of this Manual does not change this requirement. The Manual does provide a set of stormwater management practices which if followed Ecology believes will meet the current federal and state regulatory requirements to prevent pollution and protect water quality.*

- b. Ecology exceeds federal requirements without statutory authority or substantial evidence of need which further violates the State Administrative Procedures Act.

*RESPONSE: Ecology does not establish any independent regulatory requirements or authority with the Manual; only rules or permits can meet or exceed federal requirements.*

- e. Under the current NPDES General Sand and Gravel Permit, state wide monitoring over the past several years hasn't shown any significant adverse impact of sand and gravel, concrete or asphalt operations on stormwater contamination. Our industry is already regulated by this permit and additional regulations would only add to the financial and operation burden without just cause.

*RESPONSE: Ecology has documented stormwater contamination at a number of permitted sand and gravel operations, but overall, the industry's compliance record is good. However, federal law requires NPDES permit coverage for all discharges from industrial activities, including construction, sand and gravel, concrete and asphalt operations. In Washington State, construction activities and sand and gravel operations are regulated under separate General Permits and it is not likely that the two permits will be combined.*

- f. Requirements that sites installing impervious surfaces of 5,000 or more square feet compels sites much smaller than 1 acre to comply with elements of the manual - both for development and redevelopment. This requirement that any

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site adding 5,000 square feet of impervious surface must comply with elements of the manual - both for development and redevelopment is onerous and excessive.

*RESPONSE: The purpose of the Manual is to provide a commonly accepted set of stormwater management practices, which if implemented properly, should protect water quality. This objective is independent of regulatory mandates. The Manual provides a tool to assist in protection of water quality regardless of the impetus (required by permit or TMDL, to protect drinking water source, local popular mandate, etc.). The Manual subcommittee spent a great deal of time and effort identifying an appropriate threshold for PGIS that is protective of water quality. The committee agreed unanimously that a one-acre threshold does not make sense, as a 43,500SF gas station site (less than one acre) should trigger stormwater controls for the site. After reviewing practices in other semi-arid areas of the country, the subcommittee settled on 5,000SF.*

- g. The State Building Code Council (SBCC) Erosion Control and Spill Prevention Guidelines are much more clearly articulated than the equivalent BMP's described in Chapter 7 of the Stormwater Manual. The Guidelines should either be incorporated into Chapter 7 of the SMMEW, or adopted as equivalent to the appropriate BMPs in Chapter 7.

*RESPONSE: This subcommittee discussed the proposed Model Ordinance in June-July 2002 and determined that it was not a helpful document in developing this Manual. Ecology commented on the Model Ordinance with concerns about potential confusion for local governments, because the guidance as written does not reflect prudent and established best management practices for erosion and sediment control for construction sites in Washington State; nor would only following the practices outlined in SBCC's conditionally accepted ordinance fulfill federal Clean Water Act requirements for permitted projects.*

- i. The proposed rule will impede design, permitting, and implementation of salmon restoration and enhancement projects. Delays are already being realized on projects, which contradicts the state salmon recovery act which requires that "habitat projects should be implemented without delay".

*RESPONSE: The Manual is not a "proposed rule" but we presume it is the Manual to which you are referring. The Manual does not address any instream work. Because salmon restoration and enhancement projects in riparian areas are unlikely to consist of pollutant-generating impervious surfaces it is difficult to see how the Manual would delay implementation of those projects. However, construction of such projects should certainly involve careful control of erosion and sediment discharges to protect the water bodies where habitat is being restored, and the Manual will provide technical assistance to achieve this.*

- j. These regulations will only add to the tremendous financial burden of local governments and private business within eastern Washington.

*RESPONSE: We acknowledge that implementing proper stormwater management requires additional public and private resources, but believe that the prevention of future water quality problems is reasonable and prudent.*

- k. CPM Development Corp. has both practical and operational concerns with the items listed above. Ecology needs to address the concerns of business and local

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governments prior to the current version SMMEW being enacted or being used as a guidance document referral for permits and development standards. It still contains many regulations which don't affect the arid climate of the eastern side of the State.

*RESPONSE: Ecology, as a participant in the Subcommittee that developed the draft Manuals for eastern Washington, has encouraged and supported an open public process for developing the final Manual over a 2½ year period. Every effort has been made to develop a Manual that meets the needs of project proponents in diverse eastern Washington settings with annual precipitation ranging from 6 to more than 60 inches. We look forward to getting additional feedback as project proponents begin to better understand the Manual and make good-faith efforts to implement the guidance therein to protect water quality from the impacts of urban stormwater.*

**14. Stormwater Management Inc. (August 25)**

- a. Chapter 1 Introduction, 1.1.3 Presumptive versus Demonstrative Approaches to Protecting Water Quality: It is suggested that Ecology's presumptive BMP approach has a verification plan under Ecology's testing protocol. This information should be included in the manual or on Ecology's website.

*RESPONSE: The testing protocol applies only to new water quality treatment technologies, which are a subset of the Demonstrative Approach. Because of the wide range of possible scenarios for developing Demonstrative Approaches for projects in eastern Washington, including the expected level of performance monitoring and verification, this information is not included in the Manual. However, once these projects are identified and begin to move forward, we could post summaries on Ecology's website for other project proponents to follow them as examples.*

**15. Building Industry Association of Washington (August 25)**

- a. Status of SMMEW as a Regulatory Document: BIAW appreciates the Department's recognition in Section 1.1.1 that the SMMEW is meant to be technical guidance and not a regulatory document with independent regulatory authority. The Department included language in Section 1.1.1 apparently adapted from the "Policy Statement to be Published in the Washington State Register" regarding the Stormwater Management Manual for Western Washington that was derived upon settlement of parts of a lawsuit regarding the Department's general NPDES permit for industrial discharges. Despite the Department's inclusion of this language, BIAW nevertheless has concerns that the SMMEW, like its Western Washington counterpart, becomes a binding backdoor regulation on property owners when local governments adopt its provisions in whole or in part as local ordinances. BIAW believes that local governments are either under tremendous pressure to adopt the Manual as part of their stormwater programs or do so because it presents an easier course to simply reduplicate Ecology's work. Moreover, Ecology has and continues to require compliance with the Western Manual as a condition of permit approval, which makes the manual's content binding regulation. Moreover, BIAW has concerns that despite the Department's characterization of the Manual, it nevertheless meets the definition of rulemaking under



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Washington's Administrative Procedures Act, RCW Ch. 34.05, and insofar as the SMMEW could be construed as a "rule" under RCW 34.05.010, the Department has not undergone a formal rulemaking process.

*RESPONSE: The department has not undergone formal rulemaking on the Manual because the Manual is not a rule according to the definition of a rule under RCW 34.05.010. See also response to comment 13.a.*

A substantial component of the formal rulemaking process is a Small Business Economic Impact Statement created pursuant to the Regulatory Fairness Act, RCW Chapter 19.85, which both analyzes the impact of a rule on small businesses (like BIAW members), opens the possibility to mitigation of adverse impacts, and requires analysis of whether the probable benefits of the rule outweigh its probable costs. The Department's Cost Analysis, provided in the appendices of the SMMEW, does not engage in this kind of analysis. Accordingly, while BIAW does not necessarily contend the Department should adopt the SMMEW through formal rulemaking, BIAW believes that recourse to certain Administrative Procedure Act and Regulatory Fairness Act provisions, such as the analyses required by a Small Business Economic Impact Statement, would give the SMMEW greater credibility as a regulatory or quasi-regulatory program the probable benefits of which outweigh the probable costs.

*RESPONSE: The Manual is not a regulation and does not have any independent regulatory authority. The technical requirements of the Manual only become regulatory requirements through specific conditions of a permit. In issuing general permits (e.g. the Construction Stormwater General permit) Ecology follows the administrative process outlined in chapter 173-226 WAC. One of the requirements in this regulation that Ecology must follow is the development of a small business economic impact statement for the permit which analyzes the impacts of the proposed permit on small businesses.*

- b. **Thresholds for Compliance – Lot Size:** Under the SMMEW, all new development must comply with Core Elements 1-4 and 8. Any redevelopment of more than 5,000 square feet of pollution-generating impervious surface (PGIS) must comply with Core Elements 1-4 and 7-8. These thresholds are too stringent as a matter of law and as a matter of fact. Federal Clean Water Act statutes and regulations (Phase I and II) do not require development or redevelopment sites disturbing less than 1 acre of land to comply with state stormwater programs. The SMMEW exceeds federal standards without providing any discussion or analysis of credible data as to whether higher compliance thresholds will result in net improvements to water quality or justify higher regulatory costs. Furthermore, these higher thresholds are too stringent for the amount of rain typically received in Eastern Washington. A typical 6-month, 24-hour water quality storm in Eastern Washington is between 0.56 and 1.1 inches of rain. The runoff from 5,000 square feet of PGIS is between 230 and 460 cubic feet of water, at an hourly average of 0.06 to 0.12 cubic feet per second during a 24-hour storm. This is a very low, practically negligible, runoff rate with very little likelihood of impacting water quality.

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For projects using underground infiltration, projects not classified as high-use sites (per Section 2.2.5) and projects that do not discharge to surface waters of the state, the impact of such low volumes of runoff does not justify the level of expense required to comply with the identified Core Elements of the SMMEW. Setting compliance thresholds at higher levels as justified by credible scientific data, such as 1 acre as required by Phase II, would significantly reduce the number of projects requiring further analysis and thus reduce the economic burden the SMMEW would otherwise place on development and redevelopment in Eastern Washington. Moreover, a change in compliance thresholds would reduce costs for both local governments and the Department in the review and enforcement of Stormwater Pollution Prevention Plans.

*RESPONSE: What is inherent in each Core Element of the Manual is that it only becomes a requirement through a permit or other regulatory program. Therefore, only new development and redevelopment that requires a water quality permit must comply with the Core Elements. The technical requirements of the Manual do not exceed federal requirements; indeed the intent of the Core Elements is to identify prudent practices that will protect water quality under a number of different regulatory programs, including the Clean Water Act's NPDES programs for municipal, industrial and construction stormwater; the Safe Drinking Water Act's Underground Injection Control Program; and others. The Manual subcommittee spent a great deal of time and effort identifying an appropriate threshold for PGIS that is protective of water quality. The committee agreed unanimously that a one-acre threshold does not make sense, as a 43,500SF gas station site (less than one acre) would not require appropriate stormwater controls. After reviewing practices in other semi-arid areas of the country, the subcommittee settled on 5,000SF. You are correct in presuming that an individual project is unlikely to cause adverse water quality impacts; however, the challenge of urban stormwater management is protection of water quality from the cumulative impacts of many projects that together will impact water quality. The semi-arid landscape provides additional challenges in managing urban runoff because the extended dry periods between rainstorms allow for a greater pollutant load to accumulate. The Manual's technical requirements for water quality treatment do change with the nature of the land use generating the pollutants, and an extensive menu of BMPs is available for selecting facilities appropriate to the site conditions. Local governments have an opportunity to plan and provide regional water quality treatment facilities to address the cumulative impacts issue; they most likely will also, under the Phase II NPDES permit, have the opportunity to prioritize and target their plan review procedures and may only be required to regulate (e.g. review and approve plans for) development projects that disturb more than one acre. We recognize that on-site stormwater management will take time to become standard practice, but are confident that the guidance provided in this Manual is prudent to protect water quality.*

- c. Exemption for Single Family Residential Construction: If the Department does not exempt all sites of less than one acre from coverage under the SMMEW, it should, according to the principles set forth above, give serious consideration to

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exempting the construction of single family residences from SMMEW coverage under Section 2.1.3. BIAW does not believe the Department has demonstrated with credible data how the level of use and pollutant loading from single family residential property warrants the level of expense required to comply with the Core Elements.

*RESPONSE: The stormwater management practices in the Manual were developed over the last 2½ years by a wide range of interest groups as a prudent set of management practices to prevent water quality problems as a result of improperly managed stormwater. Single family residential construction can result in substantial sediment loading and water quality problems. The Manual provides guidance for project proponents on how to properly manage stormwater to prevent water quality problems. Ecology also encourages local governments to use their authorities to achieve improvements where needed to control erosion and sediment. Unless a smaller project is either (1) part of a larger project or (2) in a critical or sensitive area, it would not be required to seek coverage under the general NPDES permit for stormwater associated with construction activities. And unless required by the local jurisdiction or some other permit or regulatory program, it would not be required to implement post-construction stormwater controls. As noted in the prior response, it does not make sense to exempt areas of PGIS less than one acre from the Core Elements, as the cumulative impacts of all of the uncontrolled sources of pollution in a watershed do have reasonable potential to impact water quality.*

- h. Growth Management Act Concerns: Among the goals and requirements of Washington's Growth Management Act, RCW Ch. 36.70A (GMA), is the infill of housing into designated urban areas and the realization of urban densities commensurate with local jurisdictions' population and employment projections. The arbitrarily high thresholds for new and redevelopment housing discussed in comments 2 and 3 above may create difficulties under the GMA both for local jurisdictions and urban developers. Much urban infill will occur in small redevelopment projects under 1 acre.

Exceeding federal standards by subjecting such redevelopment to the SMMEW program only discourages infill otherwise required by the GMA by altering the investment-backed expectations of small-scale developers. At the same time, if local jurisdictions fail to meet density requirements contained in their Comprehensive Plans and Development Regulations, they open themselves to potential liability from property owners, citizen groups and others for noncompliance with the GMA. Such an unintended consequence of applying the SMMEW to the under-1 acre site further militates in favor of an exemption.

*RESPONSE: Ecology does not believe that proper stormwater management to prevent water quality problems is in conflict with the state's Growth Management Act. As noted before, it will most likely fall to the discretion of the local jurisdiction to determine whether to apply the Core Elements of the Manual to projects smaller than one acre*

- i. Concluding comment: The thrust of BIAW's concerns with the SMMEW involve the extent to which compliance with its regulatory or quasi-regulatory

program will increase the costs and lower the certainty and desirability of the day to day work of our membership. Imposing the SMMEW on single-family residential construction, or construction under 1 acre, exceeds federal standards without any showing that such a compliance threshold is necessary to protect water quality. Moreover, subjecting such small projects to the SMMEW may have the unintended consequence of creating growth management problems for local jurisdictions. The Department could help ameliorate the SMMEW's effect on the regulated community by granting appropriate waivers, exemptions, and administrative assistance as described in the foregoing.

*COMMENT NOTED: See responses to previous comments. We realize that there will be an extended learning period for project proponents and construction personnel. The State, local government and trade organizations including BIAW can be of great assistance in easing this transition period by providing construction personnel with information about the cumulative benefits of stormwater management and ensuring them that Ecology seeks to have a level playing field where these practices are uniformly and reasonably applied.*

**16. WSDOT (August 25)**

- a. General comment: For clarity, all references to "local jurisdiction" or "local permitting authority" should be changed to remove the word "local". WSDOT maintains jurisdiction within its right-of-way and, once issued, the WSDOT statewide municipal NPDES permit will govern its obligations under this permit. We understand that WSDOT would still be subject to local stormwater requirement through Critical Area Ordinances under the Growth Management Act, the Shorelines Management Act, TMDLs, adopted watershed plans, and in instances where we discharge into a jurisdiction's municipal separate stormwater system. However, while these instances may modify or change the pollutants or criteria that must be designed for, the methods, BMPs, design storms, snowmelt, reviews, and approvals are within WSDOT's control and jurisdiction and, as such, are not subject to local review.

*RESPONSE: The guidance in this Manual is targeted primarily towards local governments, and Ecology is working closely with WSDOT in developing the revised Highway Runoff Manual which will provide appropriate guidance for WSDOT road projects. We do not wish to reintroduce confusion as to whether "permitting authority" refers to Ecology or local government.*

- e. Page 1-3, Section 1.1.2. The first paragraph would be a good location to add a sentence noting that WSDOT has jurisdiction throughout WSDOT project limits aside from more stringent measures require under the Critical Area Ordinances, Shorelines Management Act, TMDLs, and adopted watershed plans. Given the manual's flexibility, it is important to clarify that WSDOT has jurisdiction over our project limits to ensure consistency in stormwater management design throughout the facility, which may traverse multiple local jurisdictions. Section 1.3.1 may also be an appropriate location for this statement.

*RESPONSE: It is not appropriate for Ecology or this Manual to make statements about the regulatory relationship between WSDOT and local governments.*

**17. Associated General Contractors (August 25)**

- a. The Stormwater Manual is a clearly a Significant Legislative Rule under RCW 34.05 the State Administrative Procedures Act (APA) and contains innumerable requirements for compliance.

Discussion of Compliance with the State Administrative Procedures Act:

Ecology's first stormwater manual was originally developed in 1992 in response to a statutory directive to the Puget Sound Water Quality Management Authority, which required that Ecology develop a stormwater technical manual for use by local governments and state agencies in Puget Sound. At that time, the Manual was a totally voluntary document for use by local governments who chose to utilize it for stormwater management purposes. It should be noted that subsequent amendments to the statutory authority for the Puget Sound Water Quality Authority removed all reference to the manual.

*RESPONSE: Ecology notes here that the original statutory language establishing the Puget Sound Water Quality Authority made no specific reference to the development of a stormwater manual. The statutory directive under Chapter 90.70 RCW was to the Puget Sound Water Quality Authority to develop a Puget Sound Water Quality Management Plan (the Plan). One element of the Plan was a directive to the Department of Ecology to develop a stormwater technical manual to be used by local governments. In 1997 the Puget Sound Water Quality Authority was replaced with the Puget Sound Water Quality Action Team. The statutory directive to the Action Team was very similar to the directive to the earlier Water Quality Authority, namely the creation of a comprehensive Puget Sound Water Quality Management Plan.*

The ability of Ecology to develop the manual however, is not in question here. Under Washington's Water Pollution Control Act, Ecology is authorized to "take all action necessary to secure to the state the benefits and to meet the requirements of [the Clean Water Act.]" RCW 90.48.260. The Legislature also granted Ecology a number of specific powers, including:

"Complete authority to establish and administer a comprehensive state point source waste discharge or pollution discharge elimination permit program which will enable the department to qualify for full participation in any national waste discharge or pollution discharge elimination permit system and will allow the department to be the sole agency issuing permits required by such national system operating in the state of Washington subject to the provisions of RCW 90.48.262(2). Program elements authorized herein may include, but are not limited to: (a) Effluent treatment and limitation requirements together with timing requirements related thereto; (b) applicable receiving water quality standards requirements; (c) requirements of standards of performance for new sources; (d) pretreatment requirements; (e) termination and modification of permits for cause; . . . (h) requirements for inspection, monitoring, entry, and reporting; . . . (RCW 90.48.260(1))

The Legislature has also given Ecology a substantial amount of authority to implement the Water Pollution Control Act:

"[Ecology] shall have the authority to, and shall promulgate, amend, or rescind such rules and regulations as it shall deem necessary to carry out the provisions

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of this chapter, including but not limited to rules and regulations relating to standards of quality for waters of the state and for substances discharged therein in order to maintain the highest possible standards of all waters of the state in accordance with the public policy as declared in RCW 90.48.010.” (RCW 90.48.035.)

While this provision does not limit Ecology’s authority to adopt rules and regulations, a different provision of RCW Chapter 90.48 is clear statement by the Legislature that rulemaking is the preferred method for Ecology to exercise its administrative authority:

“[T]he powers established under RCW 90.48.260 shall be implemented by the department through the adoption of rules in every appropriate situation.”

The question is “Is the manual a rule?” Section 34.05.010 of the State APA defines a “rule” as follows:

“any agency order, directive, or regulation of general applicability (a) the violation of which subjects a person to a penalty or administrative sanction; (b) which establishes, alters, or revokes any procedure, practice, or requirement relating to agency hearings; . . .”

*RESPONSE: The manual does not have any independent regulatory authority and is not a rule or regulation as defined in RCW 34.05.010. See response to comment 13.a.*

In addition, the 1995 Regulatory Reform Act (HB 1010) adopted a new section on “significant legislative rules” with the following definition: “A “significant legislative rule” is a rule other than a procedural or interpretive rule that (A) adopts substantive provisions of law pursuant to delegated legislative authority, the violation of which subjects a violator of such rule to a penalty or sanction; (B) establishes, alters, or revokes any qualification or standard for the issuance, suspension, or revocation of a license or permit; or (C) adopts a new, or makes significant amendments to, a policy or regulatory program.” (RCW 34.05.328(5)(c)(iii)).

At a minimum, the SMMEW “adopts a new..... policy or regulatory program” for Phase II jurisdictions in Eastern Washington. In addition, permits under the program will be conditioned on compliance with the SMMEW or an equivalent approach that satisfies State and federal laws. This means that all permittees must either comply using the prescriptive approach laid out in the SMMEW, or a performance approach that provides equivalent protection to comply with State and federal clean water laws. Therefore, the SMMEW clearly “establishes....qualification(s) or standards(s).....for the issuance, suspension, or revocation of a .....permit” under the Phase II program for construction. In addition, there are numerous instances where requirements are imbedded in the document. A partial list is provided in Table 1.

*RESPONSE: The Manual is not a significant legislative rule. The Manual does not adopt or represent a new policy or regulatory program. The Manual is not a policy or a regulatory program. The Manual is a collection of commonly accepted stormwater management practices which if implemented should result in compliance with federal and state water quality protection laws. The requirement to comply with state federal water quality protection laws and*

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*regulations exist regardless of whether the Manual exists or not. The Manual does provide project proponents and local jurisdictions with a set of stormwater management practices, however they do not become required solely based on the publication of the Manual.*

*The speculation of what will be required in future permits including whether and how the Manual is referenced is premature. If affected parties believe that the Manual is inappropriately referenced in forthcoming permits there are provisions to challenge or appeal those permits.*

Since it is obvious that the SMMEW is a “significant legislative rule” under the APA, it is then necessary for ECY to comply with a number of administrative tasks including:

“(a) Clearly state in detail the general goals and specific objectives of the statute that the rule implements;

(b) Determine that the rule is needed to achieve the general goals and specific objectives stated under (a) of this subsection, and analyze alternatives to rule making and the consequences of not adopting the rule;

(c) Determine that the probable benefits of the rule are greater than its probable costs, taking into account both the qualitative and quantitative benefits and costs and the specific directives of the statute being implemented;

(d) Determine, after considering alternative versions of the rule and the analysis required under (b) and (c) of this subsection, that the rule being adopted is the least burdensome alternative for those required to comply with it that will achieve the general goals and specific objectives stated under (a) of this subsection;

(e) Determine that the rule does not require those to whom it applies to take an action that violates requirements of another federal or state law;

(f) Determine that the rule does not impose more stringent performance requirements on private entities than on public entities unless required to do so by federal or state law;

(g) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by the following:

(i) A state statute that explicitly allows the agency to differ from federal standards; or

(ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and

(h) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter.

(2) In making its determinations pursuant to subsection (1)(b) through (g) of this section, the agency shall place in the rule-making file documentation of sufficient quantity and quality so as to persuade a reasonable person that the determinations are justified.”

*RESPONSE: The Manual is not a rule, significant or otherwise. Therefore the procedures in RCW 34.05.328 outlined above for significant legislative rules do not apply to the Manual.*

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In addition to these provisions agency rules are also required to comply with the Regulatory Fairness Act (RCW 19.85) which mandates that a Small Business Economic Impact Statement (SBEIS) be developed to analyze the impact of the rule on small businesses and where appropriate that those impacts be mitigated. Although Ecology has conducted a “Cost Analysis” of the SMMEW, this analysis does not analyze the effect of the manual on small business, nor does it analyze whether the “probable benefits” of the SMMEW “are greater than its probable costs taking into account both the qualitative and quantitative benefits and costs”. Therefore, it is impossible to determine whether the benefits of the SMMEW exceed the costs – which was a key requirement of the Regulatory Reform Act of 1995. It is also impossible to determine if the SMMEW will have a disproportionate impact on small businesses.

*RESPONSE: A small business economic impact statement (SBEIS) was not required not done as part of the development on the Manual. A SBEIS is required to analyze the impact of a rule on small businesses. Since the Manual is not a rule a SBEIS is not required. See also response to comment 15.a.*

Of final concern is that there is no way to determine whether the SMMEW comprises the “least burdensome alternate” for complying with both State and federal laws.

*RESPONSE: Because the Manual is not a rule and has no regulatory authority there is no requirement to evaluate whether the Manual is the “least burdensome alternative.” The use of the Manual is an option for complying with existing state and federal laws and regulatory requirements. The decision on whether to follow the Manual (the presumptive approach) or to choose to demonstrate that an alternative approach will achieve compliance with state and federal water quality requirements is up to the project proponent. The publication of this Manual simply provides an additional compliance option.*

- b. Ecology exceeds federal requirements without statutory authority or substantial evidence of need which further violates the State Administrative Procedures Act.

Discussion of Compliance with Federal Standards: If Ecology adopts the SMMEW by rule, the adoption process must include the following analysis: “(g) Determine if the rule differs from any federal regulation or statute applicable to the same activity or subject matter and, if so, determine that the difference is justified by the following:

- (i) A state statute that explicitly allows the agency to differ from federal standards; or
- (ii) Substantial evidence that the difference is necessary to achieve the general goals and specific objectives stated under (a) of this subsection; and
- (h) Coordinate the rule, to the maximum extent practicable, with other federal, state, and local laws applicable to the same activity or subject matter. (RCW 34.05.328(1)).

Thus, the first question is whether “the rule” (the SMMEW) differs from any federal regulation or statute. Assuming that Ecology undertakes such a



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comparison as part of rulemaking and determines that the SMMEW (implemented as a condition of compliance in general permits) differs from the equivalent federal regulation, Ecology then must justify the SMMEW through one of the two options in statute.

No statute “explicitly allows [Ecology] to differ from federal standards” regarding stormwater regulation. Thus, Ecology would have to show substantial evidence that the difference is necessary to achieve the goals and specific objectives of the statute that the rule implements. To meet this requirement, Ecology would likely first rely on statutory authority such as that in RCW Chapter 90.48.010 to achieve the “highest possible standards of all waters” and to “require all known, available, and reasonable methods to control” water pollution. However, Ecology’s ability to rely on these provisions from the policy section of RCW 90.48 is questionable because of RCW 34.05.322, which states:

“ . . . an agency may not rely solely on the section of law stating a statute's intent or purpose, or on the enabling provisions of the statute establishing the agency, or on any combination of such provisions, for its statutory authority to adopt the rule. An agency may use the statement of intent or purpose or the agency enabling provisions to interpret ambiguities in a statute's other provisions.”

Ecology could also assert that the “substantial evidence” requirement in RCW 34.05.328(1)(g)(ii) is not limited to state law. To exceed federal standards, ECY needs to either have explicit statutory authority or substantial evidence that the difference is necessary. It does not appear that the “substantial evidence” is based on authorization from the Legislature. Thus, Ecology could rely on ESA listings, impaired water bodies, and other programs and policies to provide evidence that a different state standard is justified. However, Section 1.2.1 – Water Quality Changes – states that “Although few data are available specifically from eastern Washington, studies across the Nation have found that urbanization causes increases in the types and quantities of pollutants in receiving waters.” In addition, Tables 1.1, 1.2, and 1.3 use studies and evidence from other states – without any substantial evidence from Eastern Washington.

Therefore, while RCW 90.48.260 clearly authorizes Ecology to implement an NDPES program that meets federal standards, there is no provision that directs Ecology to exceed the federal standards or any substantial evidence from Eastern Washington that exceeding federal requirements is necessary.

*RESPONSE: The Manual is not a rule and has no independent regulatory authority. Furthermore the Manual does not set a new standard or establish requirements that exceed federal requirements. While the Manual may establish some technical thresholds, it does not set any regulatory thresholds (see the response to 17.c below). The purpose of the Manual is to identify prudent on-site stormwater management practices to protect water quality, and there is no federal standard for such technical guidance.*

- c. Requirements that sites installing impervious surfaces of 5,000 or more square feet compels sites much smaller than 1 acre to comply with elements of the manual - both for development and redevelopment.

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Discussion of Impervious Surfaces: Phase I of the CWA regulated construction sites of a size greater than five acres and required such sites to be permitted under the NPDES program. Under Phase II, sites of from 1-5 acres have also been regulated under the program since March 2003. The requirement that any site adding 5,000 square feet of impervious surface must comply with elements of the manual - both for development and redevelopment is onerous and excessive. The SMMEW should clearly exempt all sites of less than one acre from program coverage.

*RESPONSE: The Manual is not intended only for assistance in complying with federal NPDES Phase II municipal stormwater permit requirements. It also provides guidance for compliance with industrial sites, UIC facilities and other regulated projects to which the one-acre threshold does not apply (and note that construction sites of less than one acre may also require permit coverage in certain situations). The 5,000SF threshold is a technical, not a regulatory threshold. Please also see the responses to comments 13.f and 15.b.*

- g. The State Department of Fish and Wildlife's (DFW) Hydraulic Project Approval (HPA) Program is inappropriately listed as a regulatory program that may require compliance with the SMMEW.

Discussion of Hydraulic Project Approval Program: The State Department of Fish and Wildlife's (DFW) Hydraulic Project Approval (HPA) Program is inappropriately listed as a regulatory program that may require compliance with the SMMEW. In 2002 the Legislature passed and enacted SHB 2866 which eliminates the ability of DFW to require compliance with the SMMEW as a condition of the HPA. Section 1.3.7 should be eliminated from the SMMEW.

*RESPONSE: The language in the Manual regarding Hydraulic Project Approvals was reviewed and it is consistent with SHB 2866 which was passed by the Legislature in 2002. According to the final bill report on SHB 2866, SHB 2866*

*"... established (a process) to address overlapping jurisdiction between the Department of Ecology (DOE) and the DFW regarding storm water projects. The DOE and local governments operating under the water pollution control laws are recognized as having the primary responsibility for the regulation of storm water projects. Once a storm water project has been granted a National Pollution Discharge Elimination System permit, also known as the NPDES permit, a hydraulic permit is required only for the actual construction of any storm water outfall or associated structures. The DFW may not deny or condition hydraulic permits under these circumstances based upon water quality or quantity impacts arising from storm water discharges for which the structure is being installed.*

*In other locations, the DFW may issue hydraulic permits pertaining to storm water projects, and the permits may contain provisions that protect fish life from adverse effects resulting from the direct hydraulic impacts of the discharge."*

*The vast majority of the land area in eastern Washington is not subject to coverage by an NPDES permit, so the WDFW retains the authority under the*

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*Hydraulics code to address stormwater discharges in most of eastern Washington.*

- h. The proposed rule will impede design, permitting, and implementation of salmon restoration and enhancement projects.

Discussion of Salmon Restoration and Enhancement Projects: Salmon restoration and enhancement projects that remove blockages to fish passage, stabilize stream banks, or improve existing in-water or wetland habitat are required to obtain Section 404 permits from the Army Corps of Engineers. Section 1.3.6 of the SMMEW specifically will impede design, permitting, and implementation of salmon restoration and enhancement projects by requiring Ecology review and conditioning of such projects. Delays are already being realized on projects that have been designed in East Kitsap County in Western Washington, which contradicts the state salmon recovery act which requires that “habitat projects should be implemented without delay”.

*RESPONSE: The Manual is not a “proposed rule” but we presume it is the Manual to which you are referring. The Manual does not address any instream work. It is unlikely that the Manual would apply to most salmon recovery projects, because salmon restoration and enhancement projects in riparian areas are unlikely to consist of pollutant-generating impervious surfaces. However, construction of such projects should certainly involve careful control of erosion and sediment discharges to protect the water bodies where habitat is being restored, and the Manual will provide technical assistance to achieve this. But in any case it is difficult for us to imagine how the Manual would delay implementation of those projects. See also response to comment 13.i.*

- i. The Draft Model Municipal Stormwater Program for Eastern Washington includes provisions for staffing and funding that are not required in federal law, and does not include provisions to utilize existing local government building and regulatory systems.

Discussion of Draft Model Municipal Stormwater Program for Eastern Washington: ECY has closed the comment period early on the Draft Model Municipal Stormwater Program for Eastern Washington (Model Program) due to the lack of comments during the first round. This is inappropriate given that many potential commenters, like the AGC of Washington, were not prepared to comment on the Model Program during the first round of review. The AGC of Washington is concerned that Section 1.4.4 of the Model Program assumes that additional staff, office space, and office, field, and maintenance equipment will be required for Phase II jurisdictions to implement the CWA. Yet there are no provisions requiring such additional resources in the CWA or Phase II guidance that has been adopted by EPA, or in State statute.

The Model Program also assumes the creation of new entities like “Storm Water Utilities” to implement CWA requirements under Phase II. Although this may be one viable alternative for Phase II implementation, the Model Program gives no consideration to other cost-effective alternatives. Utilizing existing regulatory programs like the building and fire code enforcement programs to regulate on-site erosion control and spill prevention for construction sites in the jurisdiction that are covered under Phase II are not considered in the Model

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Program. For site plan review, inspections, and post construction compliance and maintenance inspections local building departments have staff already trained in building construction and plan review techniques that may be able to assimilate CWA related functions at minimal or lower cost than creation of whole new departments or entities. This type of approach must be explored, developed and made available as a viable alternative model for Phase II jurisdictions.

*RESPONSE: The final Model Program has been printed and distributed. Like the Stormwater Management Manual for Eastern Washington, the Model Municipal Stormwater Program for Eastern Washington is not a rule and does not establish any new regulatory requirements. The Model Program was developed to assist local jurisdictions in getting ready to comply with the federal Phase II municipal stormwater regulations. The decision of what parts of the Model Program should become Phase II permit requirements is still outstanding and will be part of the Phase II municipal stormwater permit development process. While the federal Phase II regulations did not specifically mention additional staffing and resources it is clear that the Phase II rules will require local governments to take a more active role in managing and preventing stormwater impacts within their jurisdiction. In acknowledgment of these new requirements, the Model Program includes some estimates of what these new costs could be, assuming the local jurisdiction is starting from scratch. These estimates were included at the request of local government representatives to assist local jurisdictions in planning for future possible Phase II permit requirements.*

- j. Concluding comment: Due to the far reaching effects of the manual and the Model Program on not only the regulated community but on salmon restoration and other activities, the SMMEW should be subject to full compliance with the State Administrative Procedures Act prior to being implemented by Ecology. In addition, the recommendations listed above should be adopted as part of the manual.

*COMMENT NOTED: See responses to previous comments.*

**20. City of Pasco (September 12, 2003 – late comment)**

- a. The City of Pasco would like to have the 3<sup>rd</sup> paragraph of Section 1.1.1 of the Final Draft of the Stormwater Management Manual for Eastern Washington which reads “This technology-based treatment requirement does not excuse any discharge from the obligation to apply additional stormwater management practices as necessary to comply with State water quality standards. The State water quality standards include: Chapter 173-200 WAC, Water Quality Standards for Ground Waters of the State of Washington; Chapter 173-201A, Water Quality Standards for Surface Waters of the State of Washington; and Chapter 173-204, Sediment Management Standards. Additional treatment to meet those standards may be required by federal, state, or local governments.” deleted from the manual.

*RESPONSE: The purpose of this section of the Manual is to provide the reader with background information about the regulatory framework for stormwater management and the purpose and scope of the Manual as a tool in meeting the*

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*requirements set forth in those regulations. Removal of this paragraph from the Manual will not eliminate the legal requirement to comply with water-quality based standards in addition to technology-based standards where applicable. The Manual represents the subcommittee's collective best effort at defining prudent on-site stormwater management practices that will be protective of water quality in most cases. The Manual is intended to provide guidance on proper stormwater management practices not only for municipal jurisdictions but also for industrial sites. This statement acknowledges the inherent limitations of a single technical manual in meeting the needs of every conceivable project discharging to every receiving water body in eastern Washington.*